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(54) **APPARATUS AND METHOD FOR AGGREGATING AND ACCESSING DATA ACCORDING TO USER INFORMATION**

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(63) Continuation-in-part of application No. 09/999,806, filed on Oct. 24, 2001, now Pat. No. 7,149,514, which is a continuation of application No. 09/126,268, filed on Jul. 30, 1998, now Pat. No. 6,480,714, Continuation-in-part of application No. 10/195,197, filed on Jul. 15, 2002, now Pat. No. 7,194,083.

(60) Provisional application No. 60/054,238, filed on Jul. 30, 1997.

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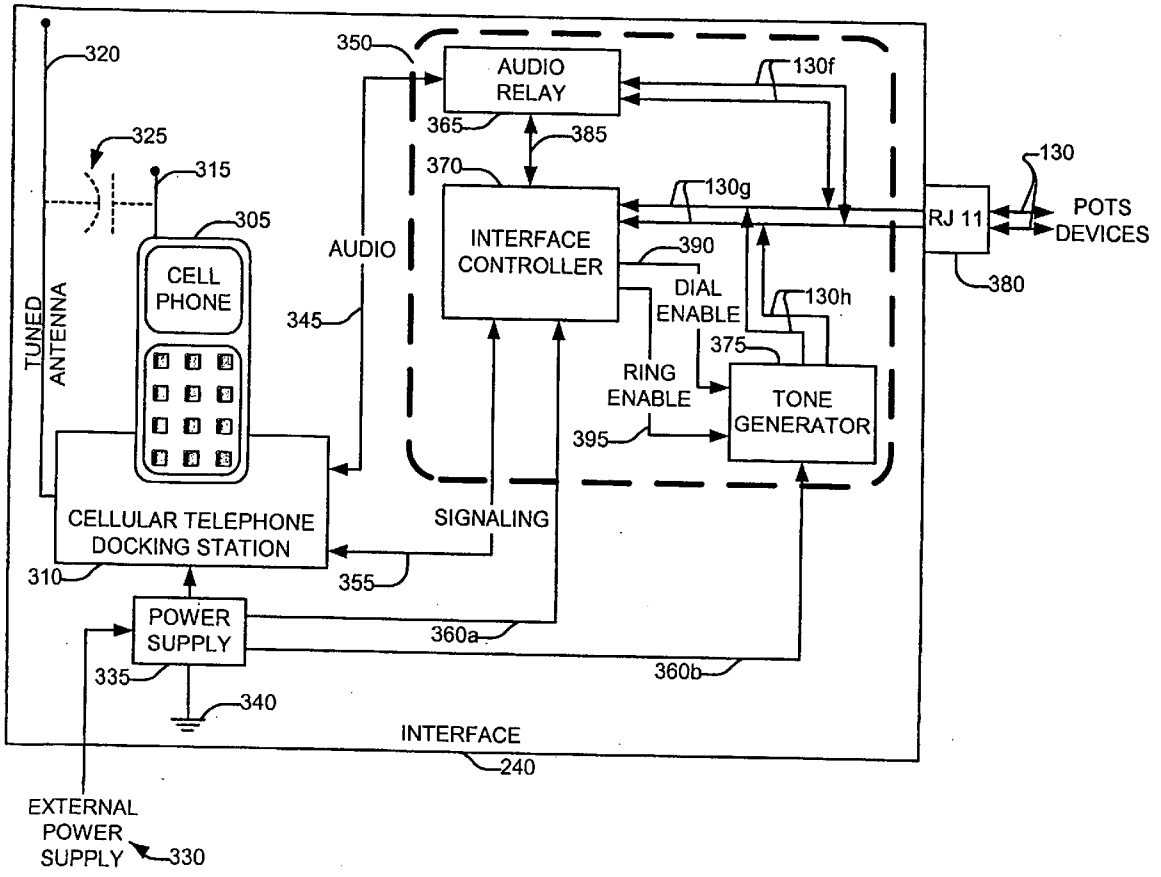
(52) **U.S. Cl.** **707/101**; 707/9; 705/34; 707/E17.006

(57) **ABSTRACT**

An apparatus and method for aggregating and accessing data according to user information are provided. According to one aspect, an interface device for providing data between a first device and a second device comprises an input, an output, logic, and a repository for storing personal data and data associated with one or more users. The input of the interface device receives data in a first format from the first device. The logic receives a data request, identifies a second device for receiving the data, identifies a second format for the second device, and translates the data to the second format. The translated data is then transmitted to the second device via the output. The logic may further collect, aggregate, and transmit the aggregated data to a requesting device. The input may be a product identification input device. The second device may be billed for the data services.



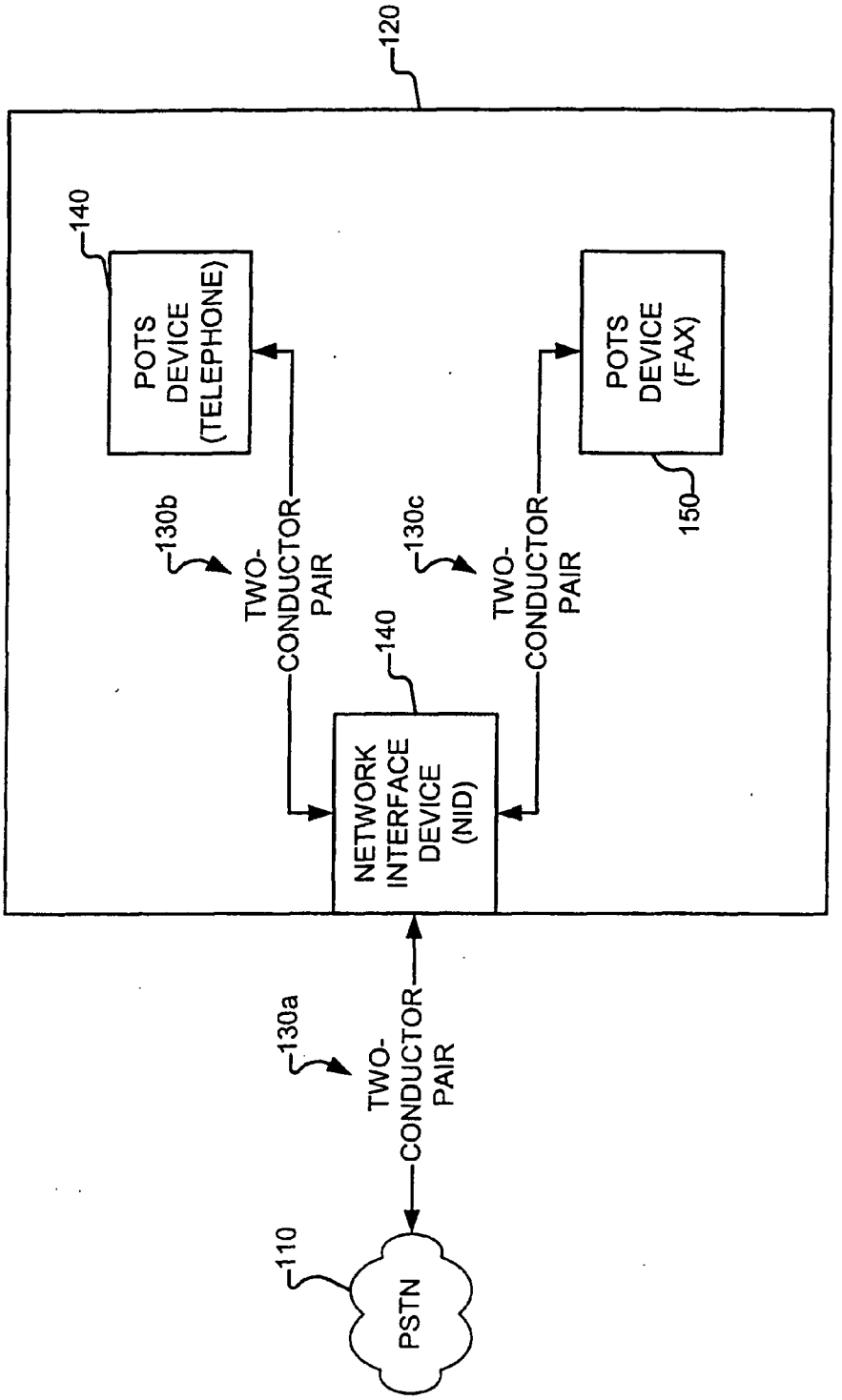


FIG. 1
(PRIOR ART)

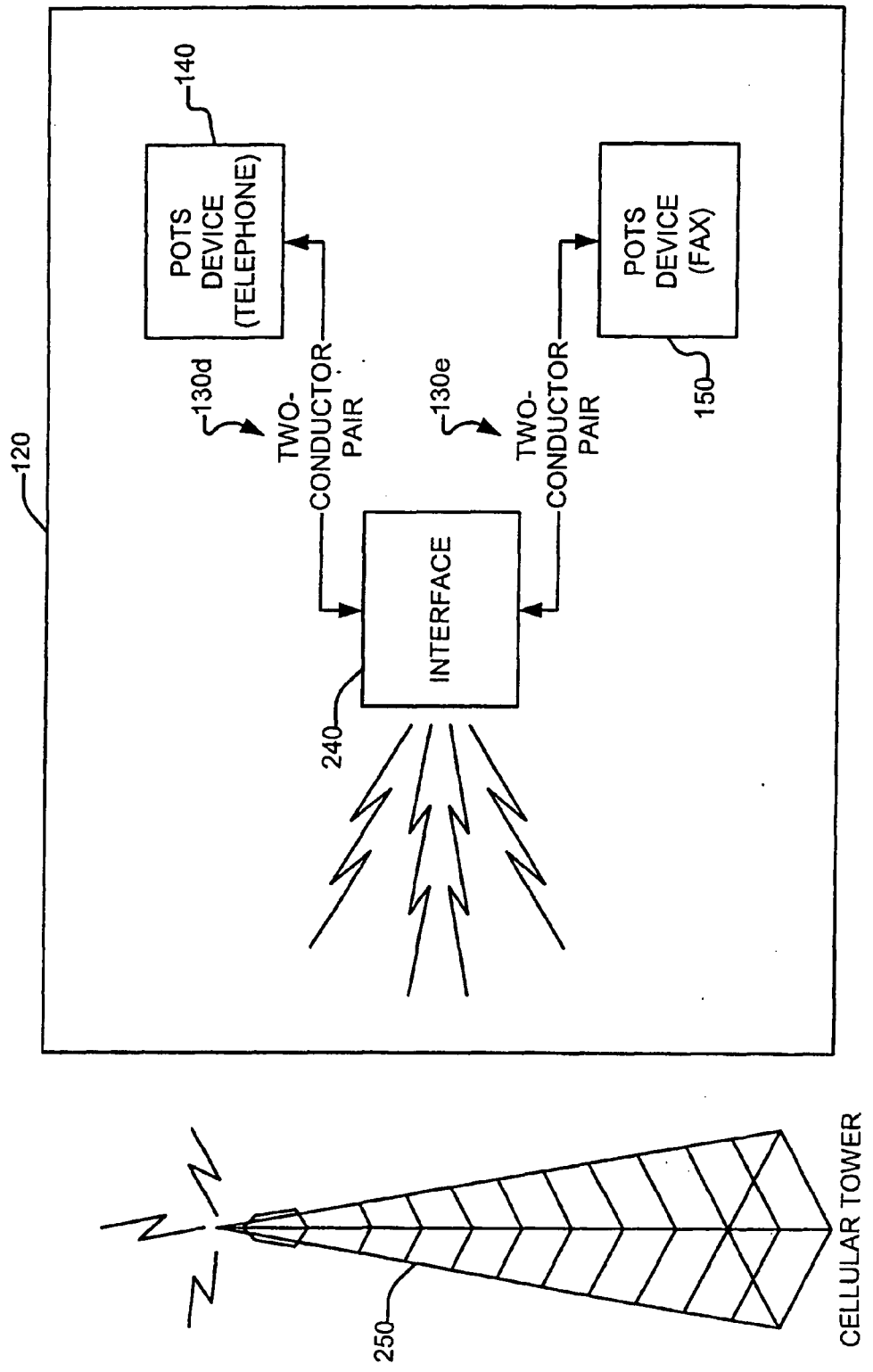

120
140
POTS DEVICE (TELEPHONE)
130d
TWO-CONDUCTOR PAIR
130e
TWO-CONDUCTOR PAIR
POTS DEVICE (FAX)
150
INTERFACE
240
250
CELLULAR TOWER

FIG. 2

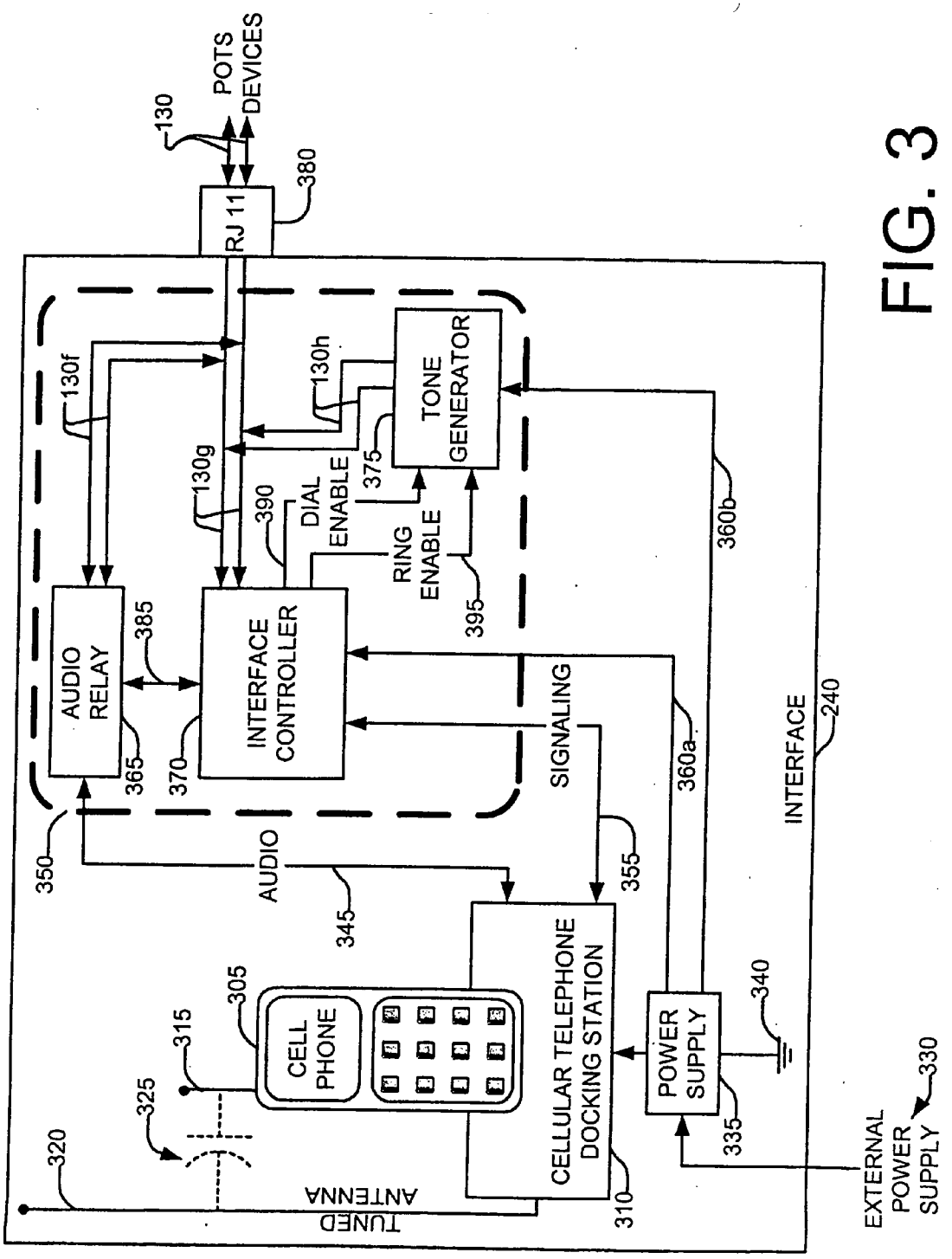

POTS DEVICES
130
RJ 11
380
130f
130h
TONE GENERATOR
130g
375
DIAL ENABLE
390
RING ENABLE
395
360b
AUDIO RELAY
385
INTERFACE CONTROLLER
365
370
SIGNALING
360a
INTERFACE
240
350
AUDIO
345
355
CELL PHONE
305
315
325
320
TUNED ANTENNA
CELLULAR TELEPHONE DOCKING STATION
310
POWER SUPPLY
340
335
EXTERNAL POWER SUPPLY
330

FIG. 3

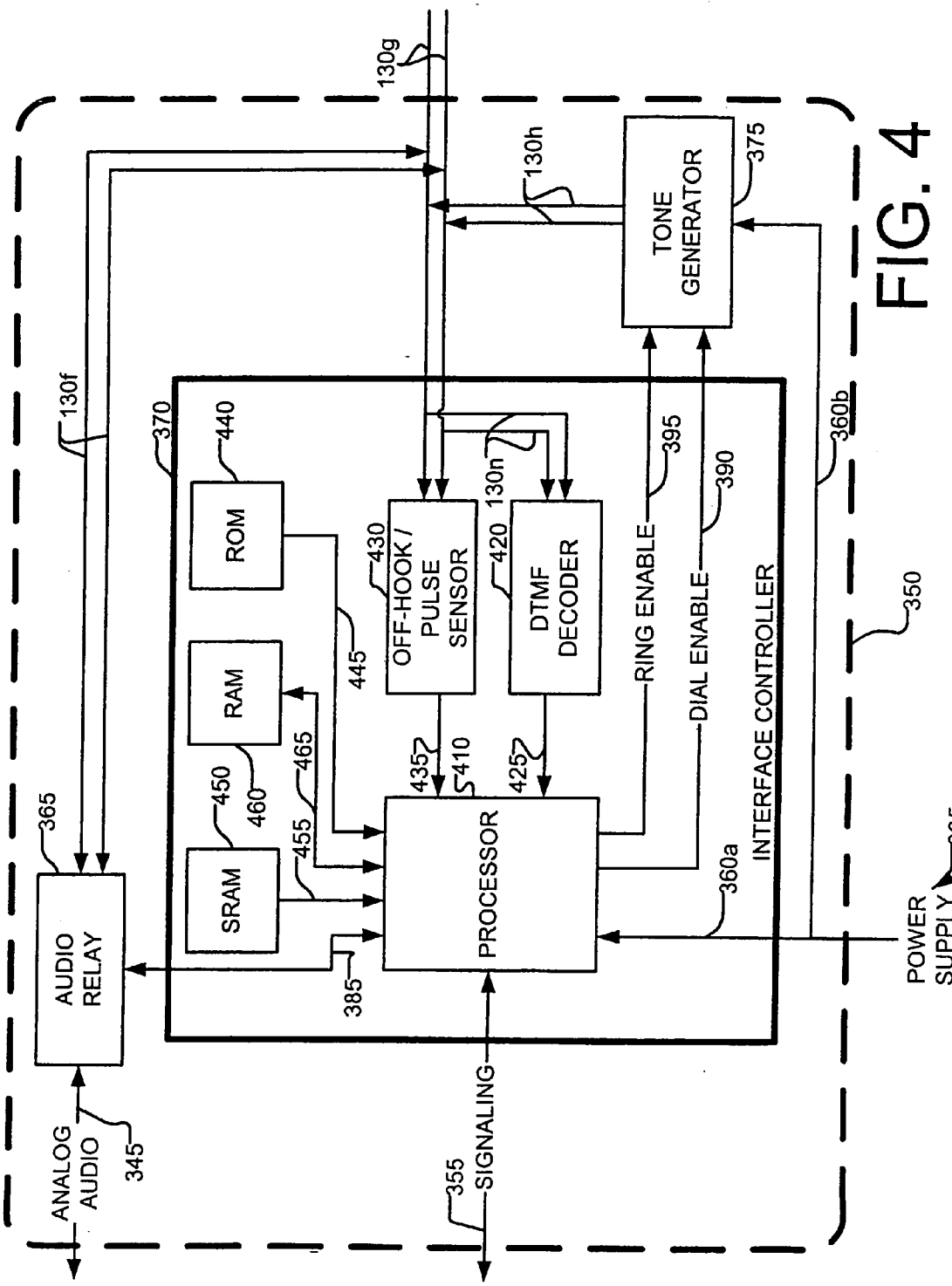

130g
130h
TONE GENERATOR
375
130f
370
440
ROM
130n
430
OFF-HOOK / PULSE SENSOR
420
DTMF DECODER
395
390
RING ENABLE
DIAL ENABLE
360b
350
INTERFACE CONTROLLER
445
RAM
465
460
450
SRAM
455
435
410
425
PROCESSOR
360a
365
AUDIO RELAY
385
POWER SUPPLY
335
ANALOG AUDIO
345
355
SIGNALING

FIG. 4

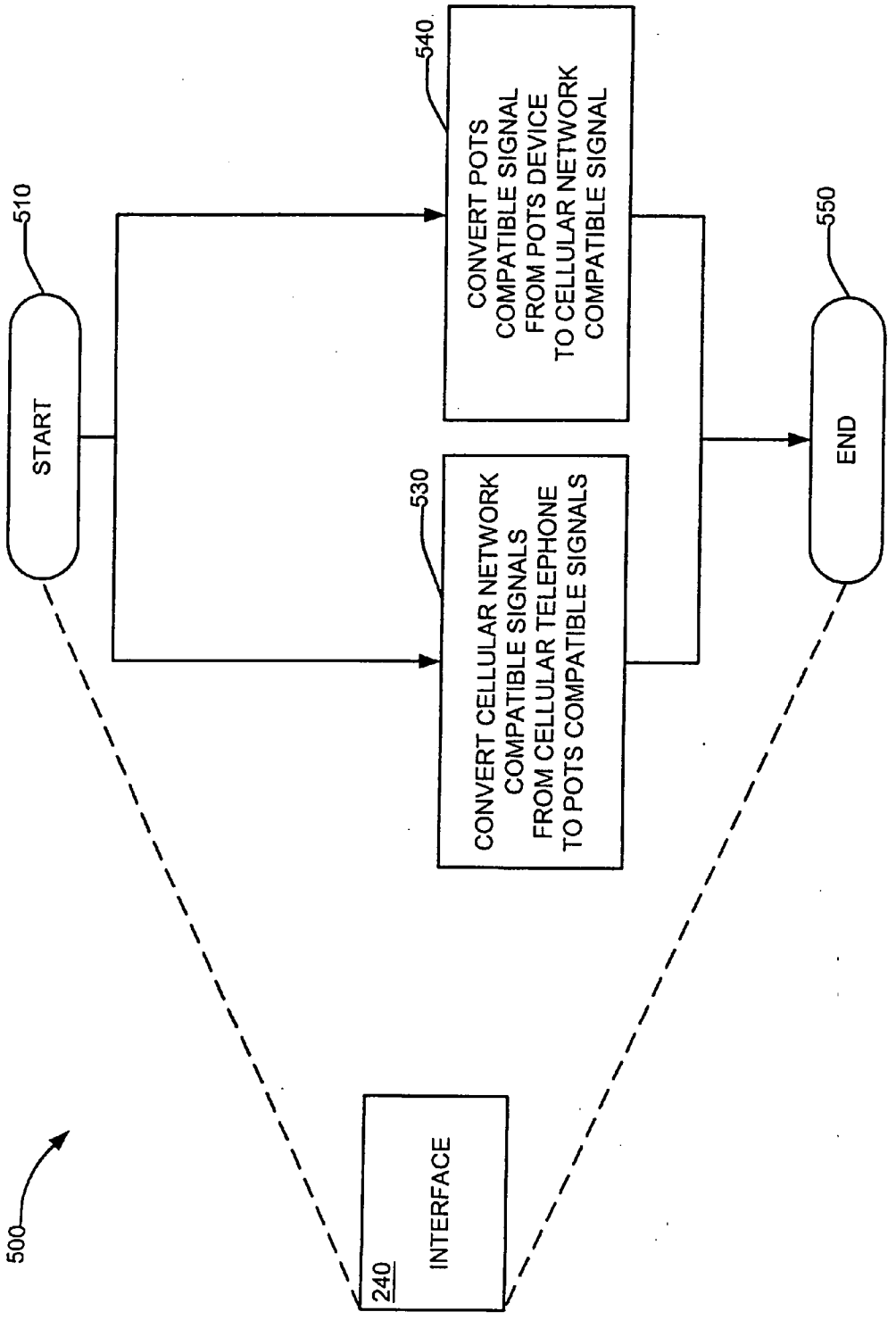

500
INTERFACE
240
START
510
CONVERT POTS COMPATIBLE SIGNAL FROM POTS DEVICE TO CELLULAR NETWORK COMPATIBLE SIGNAL
540
CONVERT CELLULAR NETWORK COMPATIBLE SIGNALS FROM CELLULAR TELEPHONE TO POTS COMPATIBLE SIGNALS
530
END
550

FIG. 5

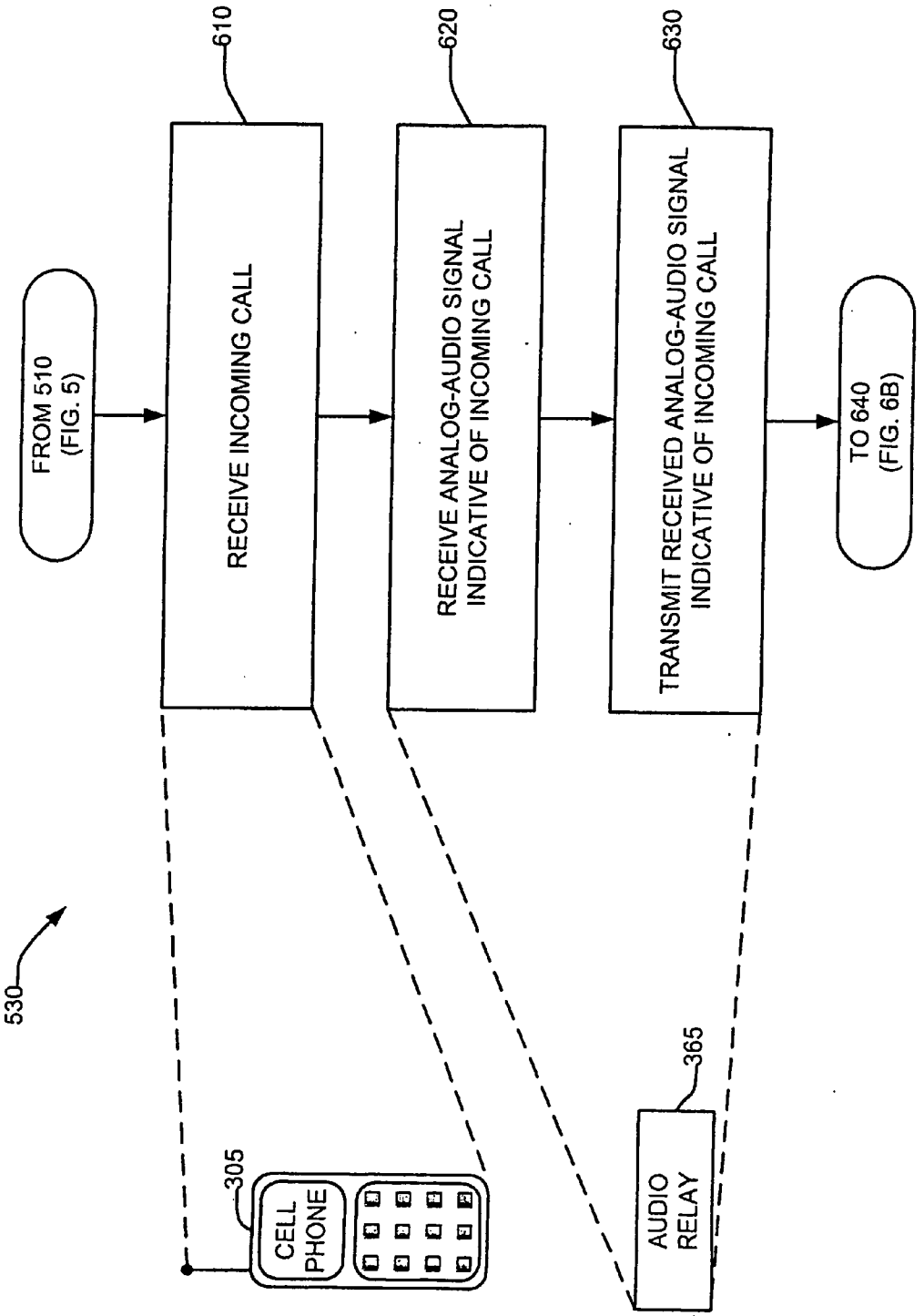

FROM 510 (FIG. 5)
610
RECEIVE INCOMING CALL
620
RECEIVE ANALOG-AUDIO SIGNAL INDICATIVE OF INCOMING CALL
630
TRANSMIT RECEIVED ANALOG-AUDIO SIGNAL INDICATIVE OF INCOMING CALL
TO 640 (FIG. 6B)
530
305
CELL PHONE
365
AUDIO RELAY

FIG. 6A

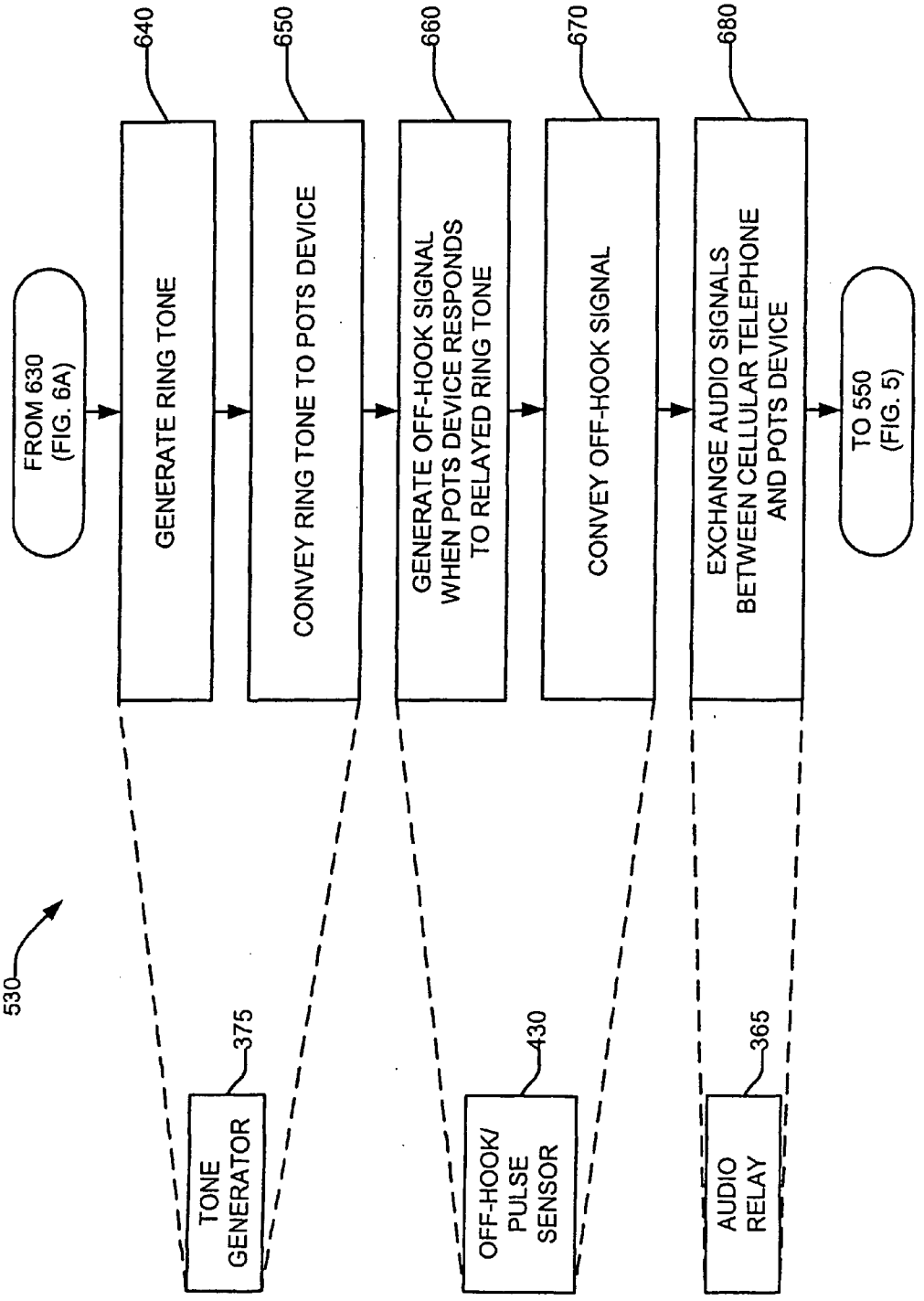

530
FROM 630 (FIG. 6A)
640
GENERATE RING TONE
650
CONVEY RING TONE TO POTS DEVICE
660
GENERATE OFF-HOOK SIGNAL WHEN POTS DEVICE RESPONDS TO RELAYED RING TONE
670
CONVEY OFF-HOOK SIGNAL
680
EXCHANGE AUDIO SIGNALS BETWEEN CELLULAR TELEPHONE AND POTS DEVICE
TO 550 (FIG. 5)
375
TONE GENERATOR
430
OFF-HOOK/ PULSE SENSOR
365
AUDIO RELAY

FIG. 6B

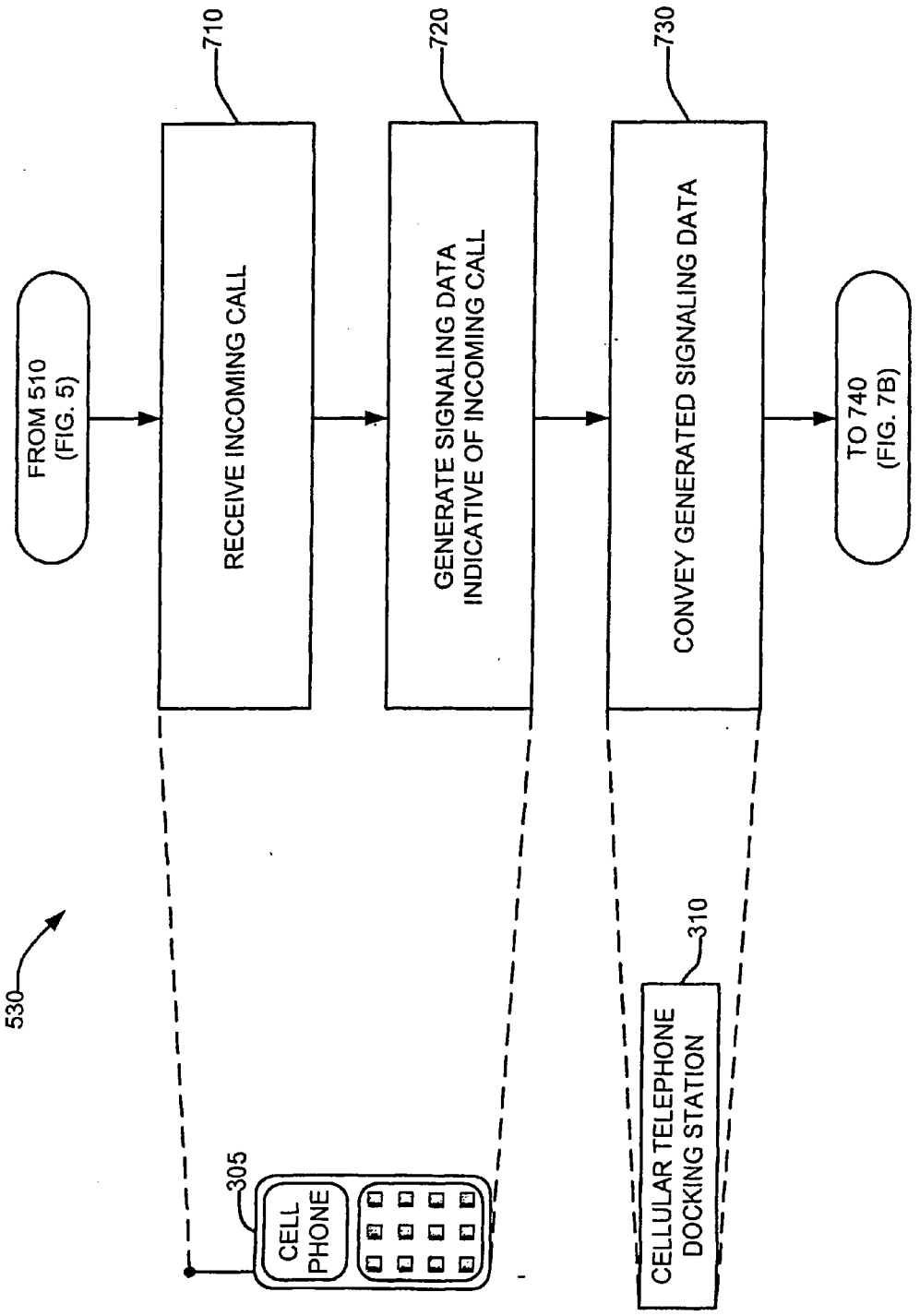

FROM 510
(FIG. 5)
710
RECEIVE INCOMING CALL
720
GENERATE SIGNALING DATA
INDICATIVE OF INCOMING CALL
730
CONVEY GENERATED SIGNALING DATA
TO 740
(FIG. 7B)
530
305
CELL
PHONE
310
CELLULAR TELEPHONE
DOCKING STATION

FIG. 7A

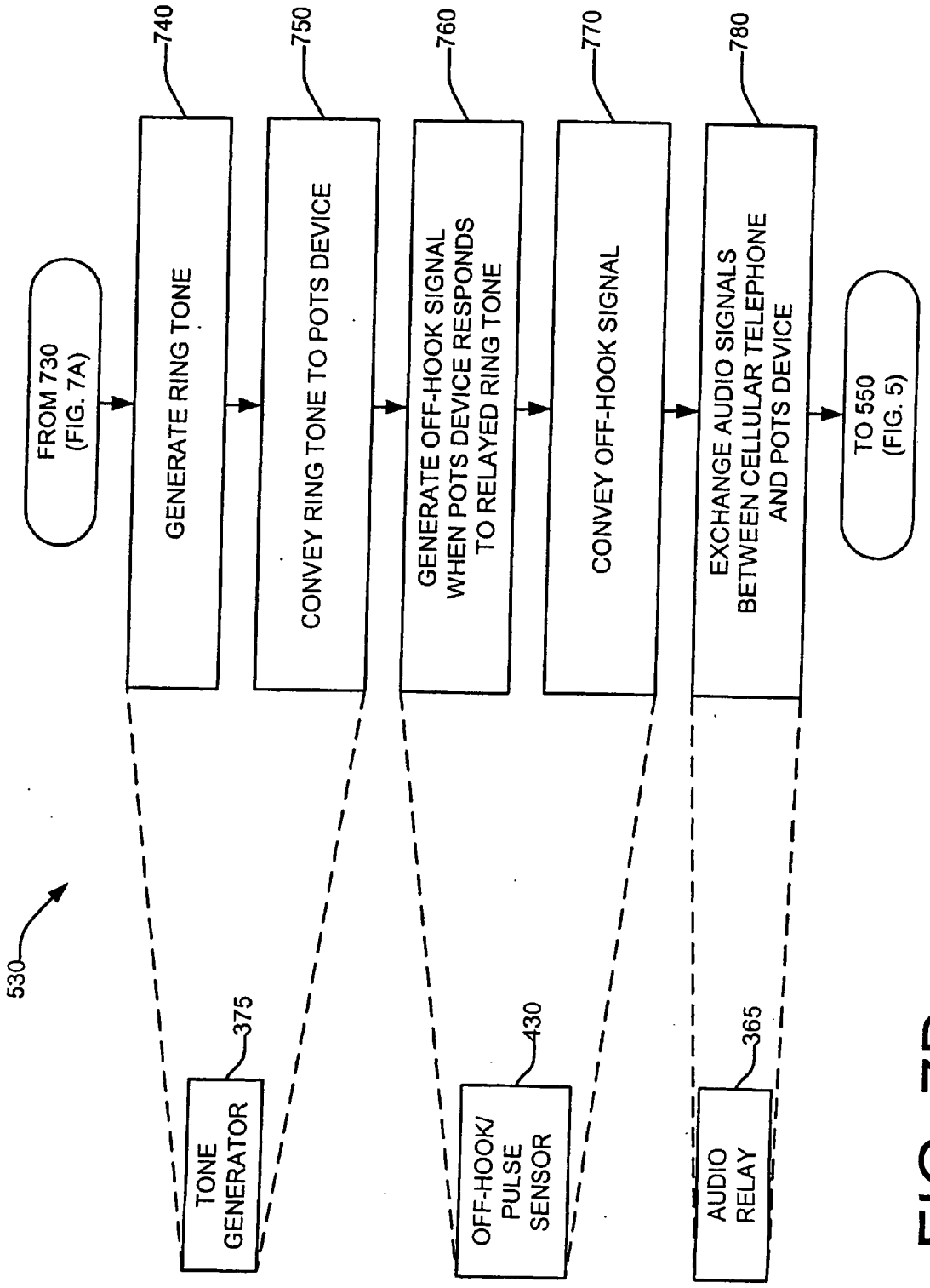

530
FROM 730 (FIG. 7A)
740
GENERATE RING TONE
750
CONVEY RING TONE TO POTS DEVICE
760
GENERATE OFF-HOOK SIGNAL WHEN POTS DEVICE RESPONDS TO RELAYED RING TONE
770
CONVEY OFF-HOOK SIGNAL
780
EXCHANGE AUDIO SIGNALS BETWEEN CELLULAR TELEPHONE AND POTS DEVICE
TO 550 (FIG. 5)
375
TONE GENERATOR
430
OFF-HOOK/ PULSE SENSOR
365
AUDIO RELAY

FIG. 7B

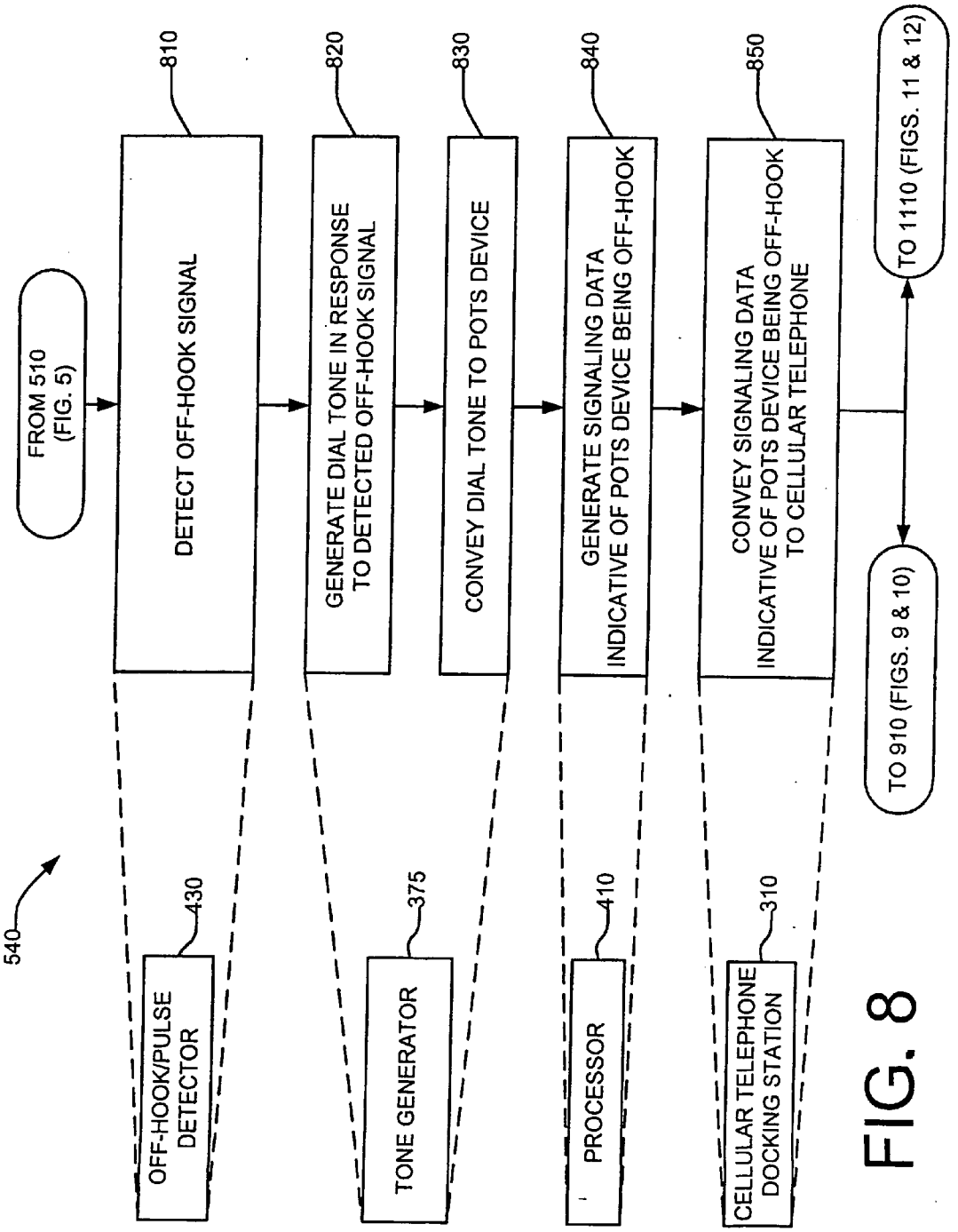

FROM 510 (FIG. 5)
DETECT OFF-HOOK SIGNAL
810
GENERATE DIAL TONE IN RESPONSE TO DETECTED OFF-HOOK SIGNAL
820
CONVEY DIAL TONE TO POTS DEVICE
830
GENERATE SIGNALING DATA INDICATIVE OF POTS DEVICE BEING OFF-HOOK
840
CONVEY SIGNALING DATA INDICATIVE OF POTS DEVICE BEING OFF-HOOK TO CELLULAR TELEPHONE
850
TO 1110 (FIGS. 11 & 12)
TO 910 (FIGS. 9 & 10)
540
OFF-HOOK/PULSE DETECTOR
430
TONE GENERATOR
375
PROCESSOR
410
CELLULAR TELEPHONE DOCKING STATION
310

FIG. 8

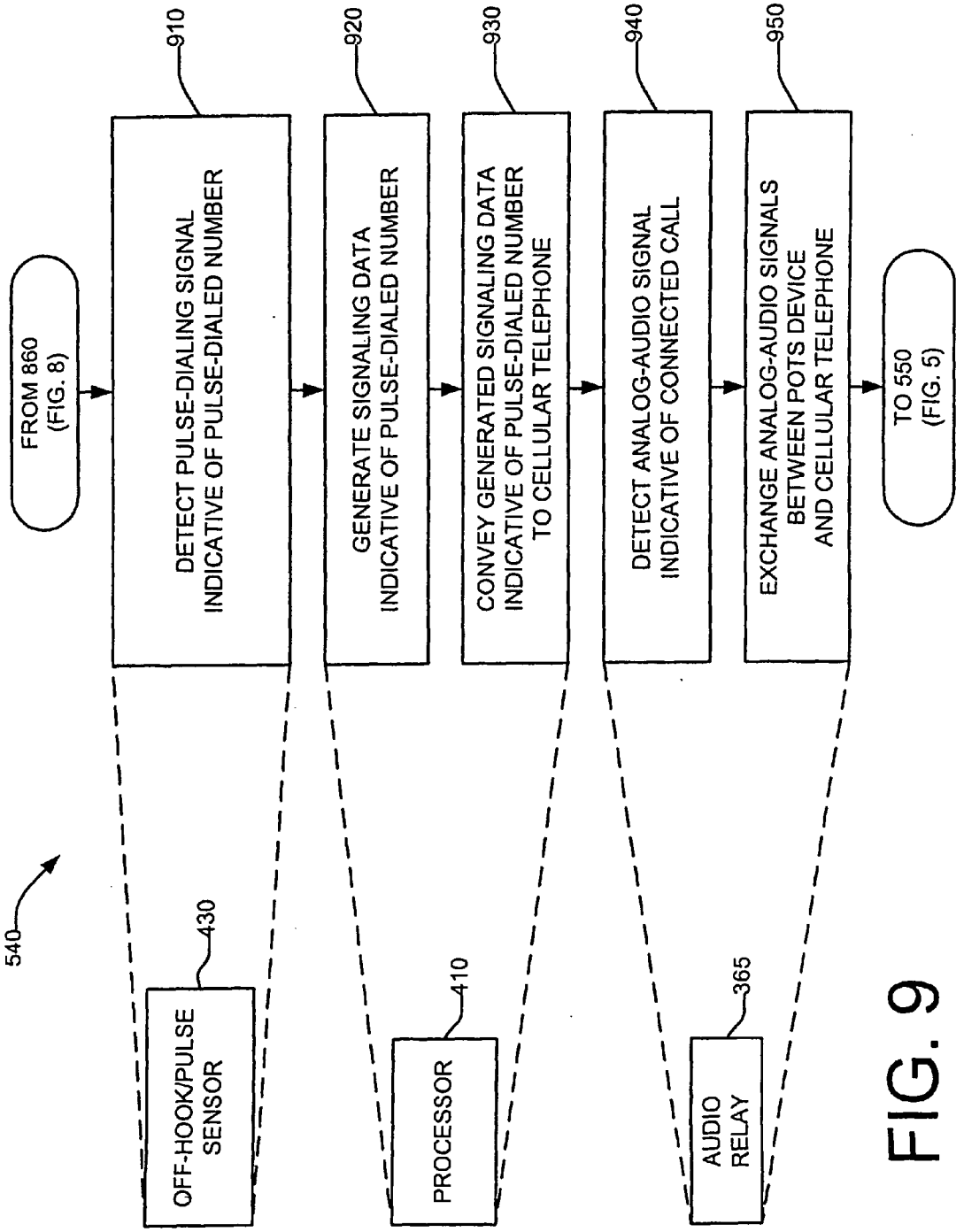

FROM 860
(FIG. 8)
910
DETECT PULSE-DIALING SIGNAL
INDICATIVE OF PULSE-DIALED NUMBER
920
GENERATE SIGNALING DATA
INDICATIVE OF PULSE-DIALED NUMBER
930
CONVEY GENERATED SIGNALING DATA
INDICATIVE OF PULSE-DIALED NUMBER
TO CELLULAR TELEPHONE
940
DETECT ANALOG-AUDIO SIGNAL
INDICATIVE OF CONNECTED CALL
950
EXCHANGE ANALOG-AUDIO SIGNALS
BETWEEN POTS DEVICE
AND CELLULAR TELEPHONE
TO 550
(FIG. 5)
540
430
OFF-HOOK/PULSE
SENSOR
410
PROCESSOR
365
AUDIO
RELAY

FIG. 9

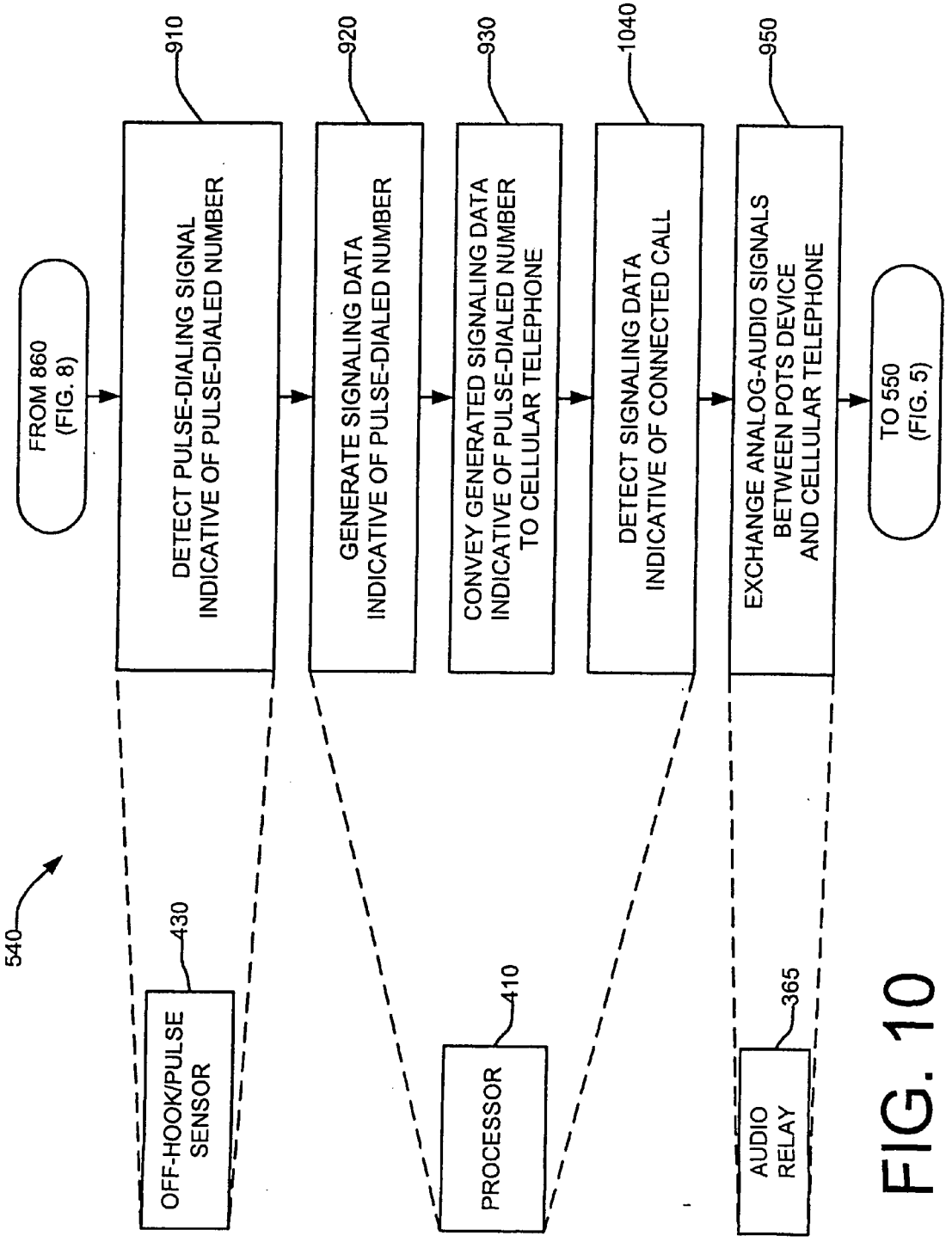

540
FROM 860 (FIG. 8)
910
DETECT PULSE-DIALING SIGNAL INDICATIVE OF PULSE-DIALED NUMBER
920
GENERATE SIGNALING DATA INDICATIVE OF PULSE-DIALED NUMBER
930
CONVEY GENERATED SIGNALING DATA INDICATIVE OF PULSE-DIALED NUMBER TO CELLULAR TELEPHONE
1040
DETECT SIGNALING DATA INDICATIVE OF CONNECTED CALL
950
EXCHANGE ANALOG-AUDIO SIGNALS BETWEEN POTS DEVICE AND CELLULAR TELEPHONE
TO 550 (FIG. 5)
430
OFF-HOOK/PULSE SENSOR
410
PROCESSOR
365
AUDIO RELAY

FIG. 10

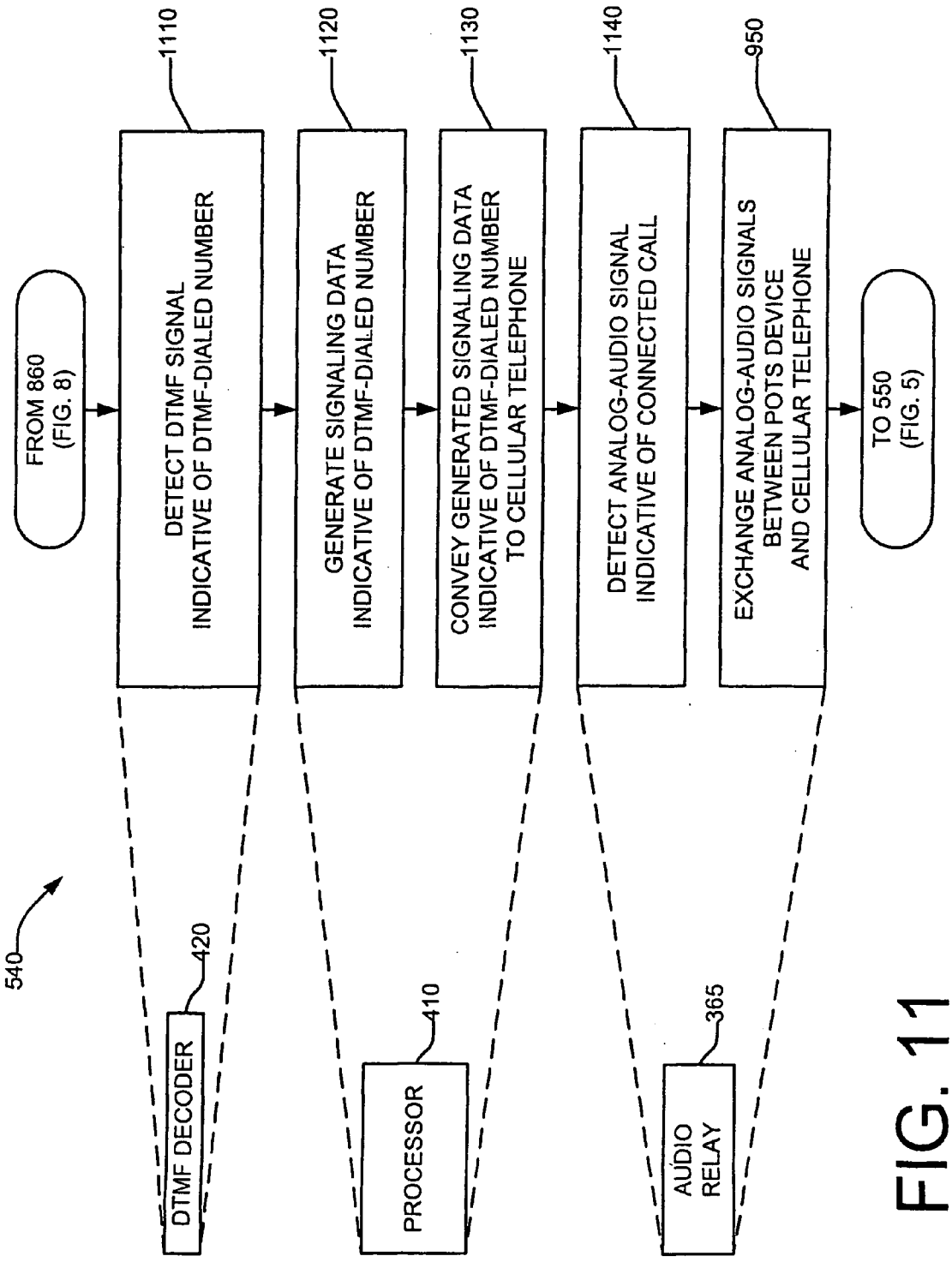

FROM 860
(FIG. 8)
1110
DETECT DTMF SIGNAL
INDICATIVE OF DTMF-DIALED NUMBER
1120
GENERATE SIGNALING DATA
INDICATIVE OF DTMF-DIALED NUMBER
1130
CONVEY GENERATED SIGNALING DATA
INDICATIVE OF DTMF-DIALED NUMBER
TO CELLULAR TELEPHONE
1140
DETECT ANALOG-AUDIO SIGNAL
INDICATIVE OF CONNECTED CALL
950
EXCHANGE ANALOG-AUDIO SIGNALS
BETWEEN POTS DEVICE
AND CELLULAR TELEPHONE
TO 550
(FIG. 5)
540
420
DTMF DECODER
410
PROCESSOR
365
AUDIO
RELAY

FIG. 11

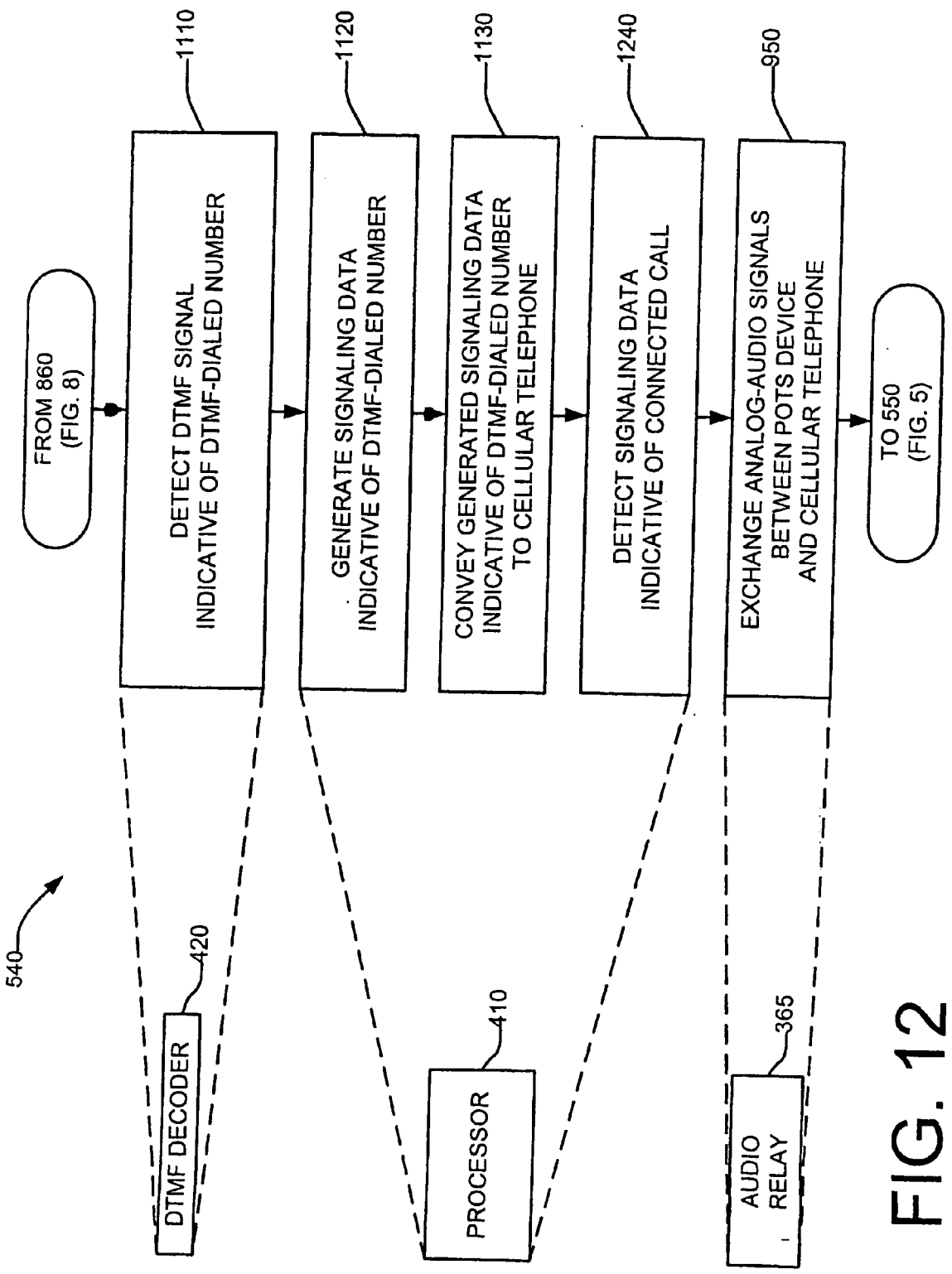

FROM 860
(FIG. 8)
1110
DETECT DTMF SIGNAL
INDICATIVE OF DTMF-DIALED NUMBER
1120
GENERATE SIGNALING DATA
INDICATIVE OF DTMF-DIALED NUMBER
1130
CONVEY GENERATED SIGNALING DATA
INDICATIVE OF DTMF-DIALED NUMBER
TO CELLULAR TELEPHONE
1240
DETECT SIGNALING DATA
INDICATIVE OF CONNECTED CALL
950
EXCHANGE ANALOG-AUDIO SIGNALS
BETWEEN POTS DEVICE
AND CELLULAR TELEPHONE
TO 550
(FIG. 5)
540
420
DTMF DECODER
410
PROCESSOR
365
AUDIO
RELAY

FIG. 12

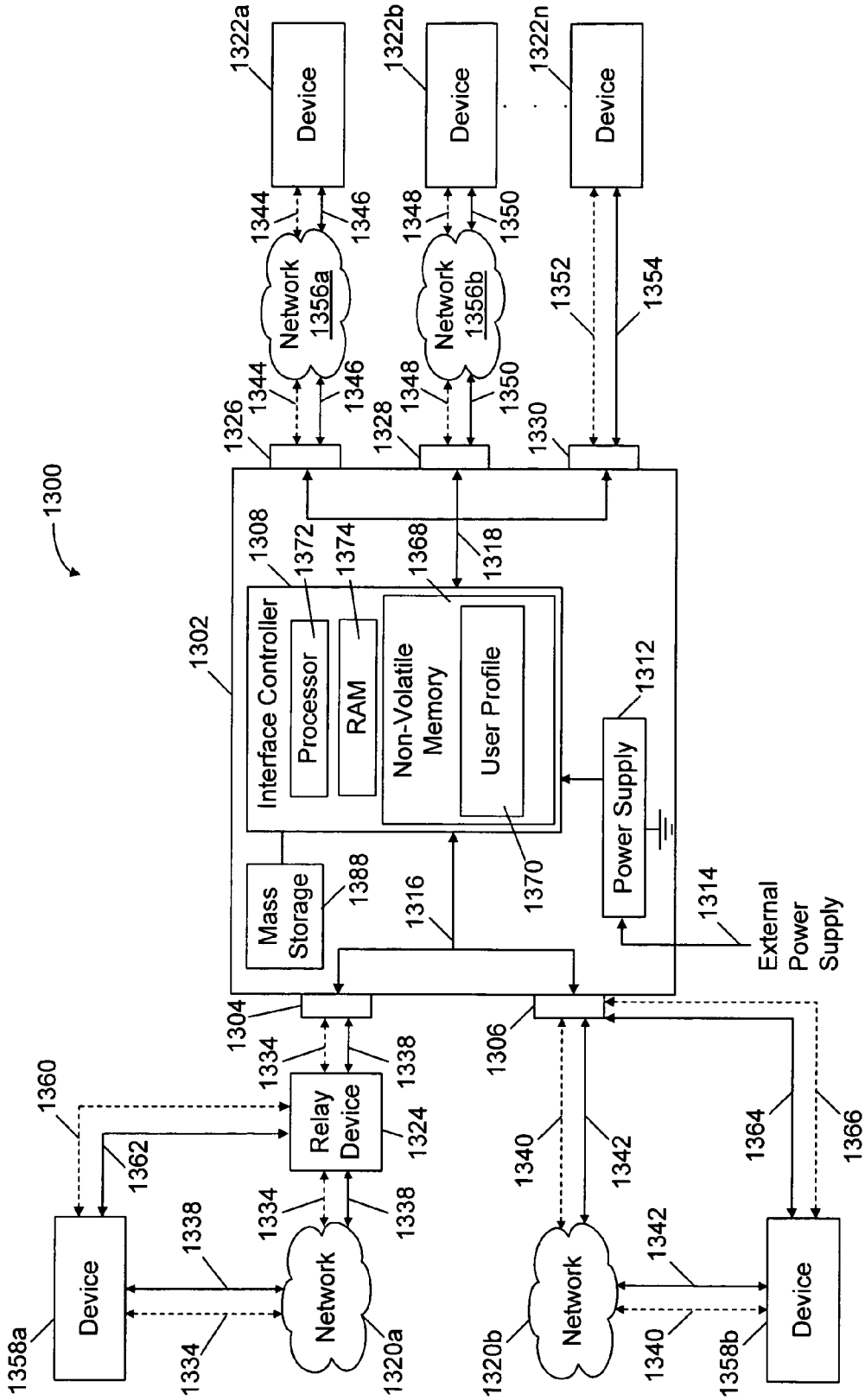

1300
1302
Interface Controller
1308
Processor
1372
RAM
1374
Non-Volatile Memory
1368
User Profile
1370
Power Supply
1312
Mass Storage
1388
1316
1318
1314
External Power Supply
1322a
Device
1322b
Device
1322n
Device
1344
1346
1348
1350
1352
1354
Network 1356a
Network 1356b
1326
1328
1330
1304
1306
1334
1338
Relay Device
1324
1360
1362
1340
1342
1364
1366
1358a
1358b
1320a
1320b
Network

FIG. 13

FIG. 14

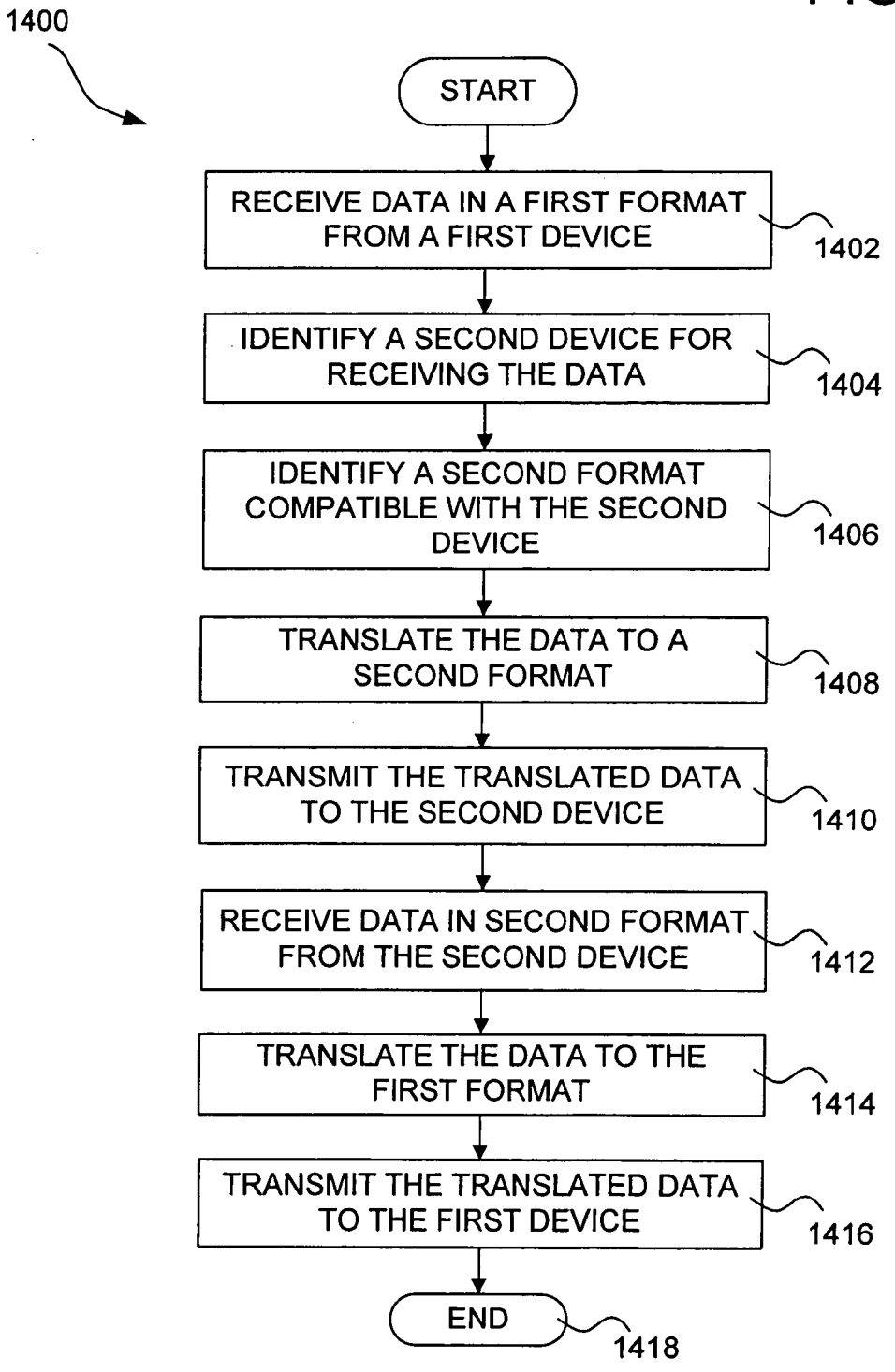

1400
START
RECEIVE DATA IN A FIRST FORMAT FROM A FIRST DEVICE
1402
IDENTIFY A SECOND DEVICE FOR RECEIVING THE DATA
1404
IDENTIFY A SECOND FORMAT COMPATIBLE WITH THE SECOND DEVICE
1406
TRANSLATE THE DATA TO A SECOND FORMAT
1408
TRANSMIT THE TRANSLATED DATA TO THE SECOND DEVICE
1410
RECEIVE DATA IN SECOND FORMAT FROM THE SECOND DEVICE
1412
TRANSLATE THE DATA TO THE FIRST FORMAT
1414
TRANSMIT THE TRANSLATED DATA TO THE FIRST DEVICE
1416
END
1418

FIG. 15

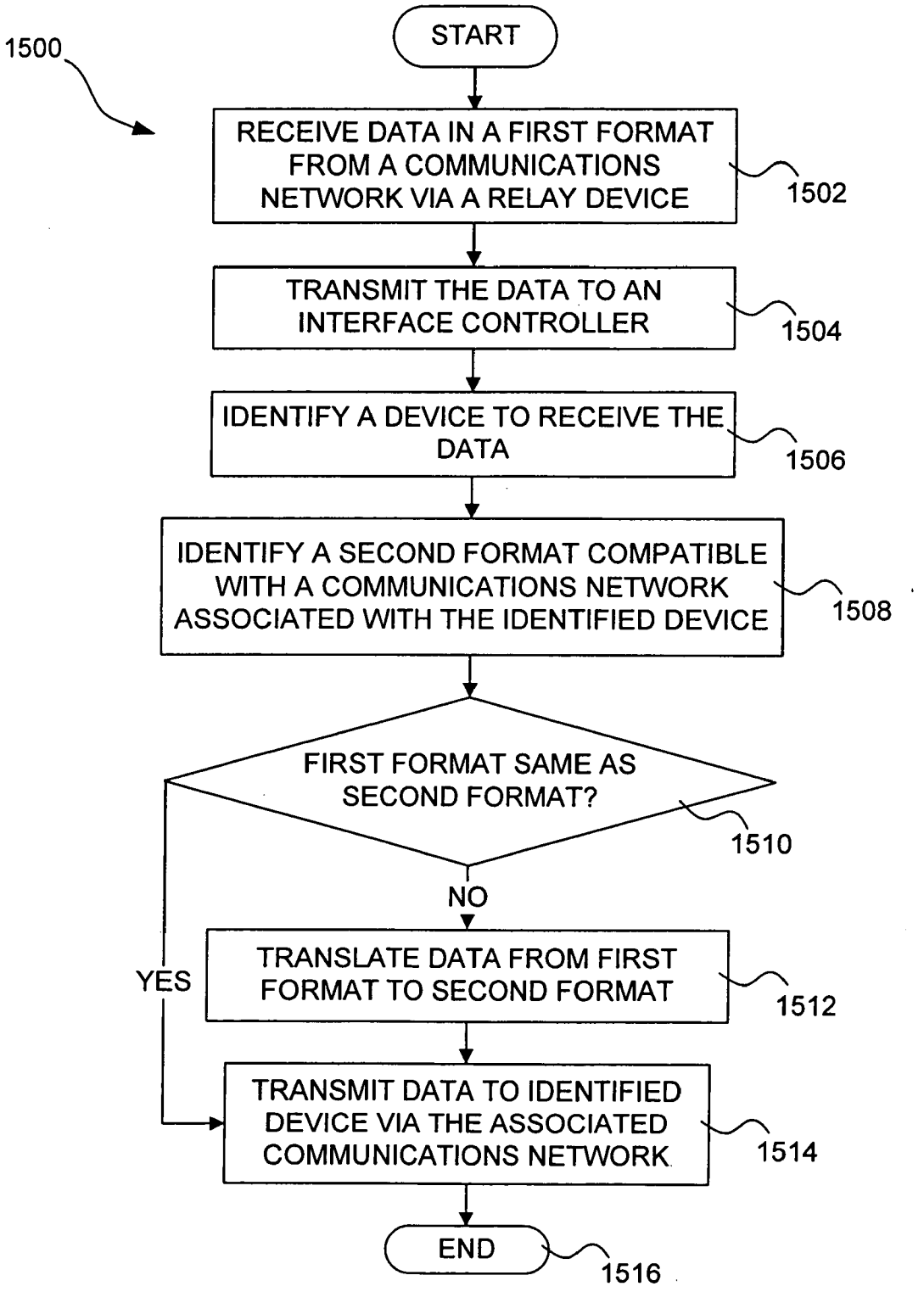
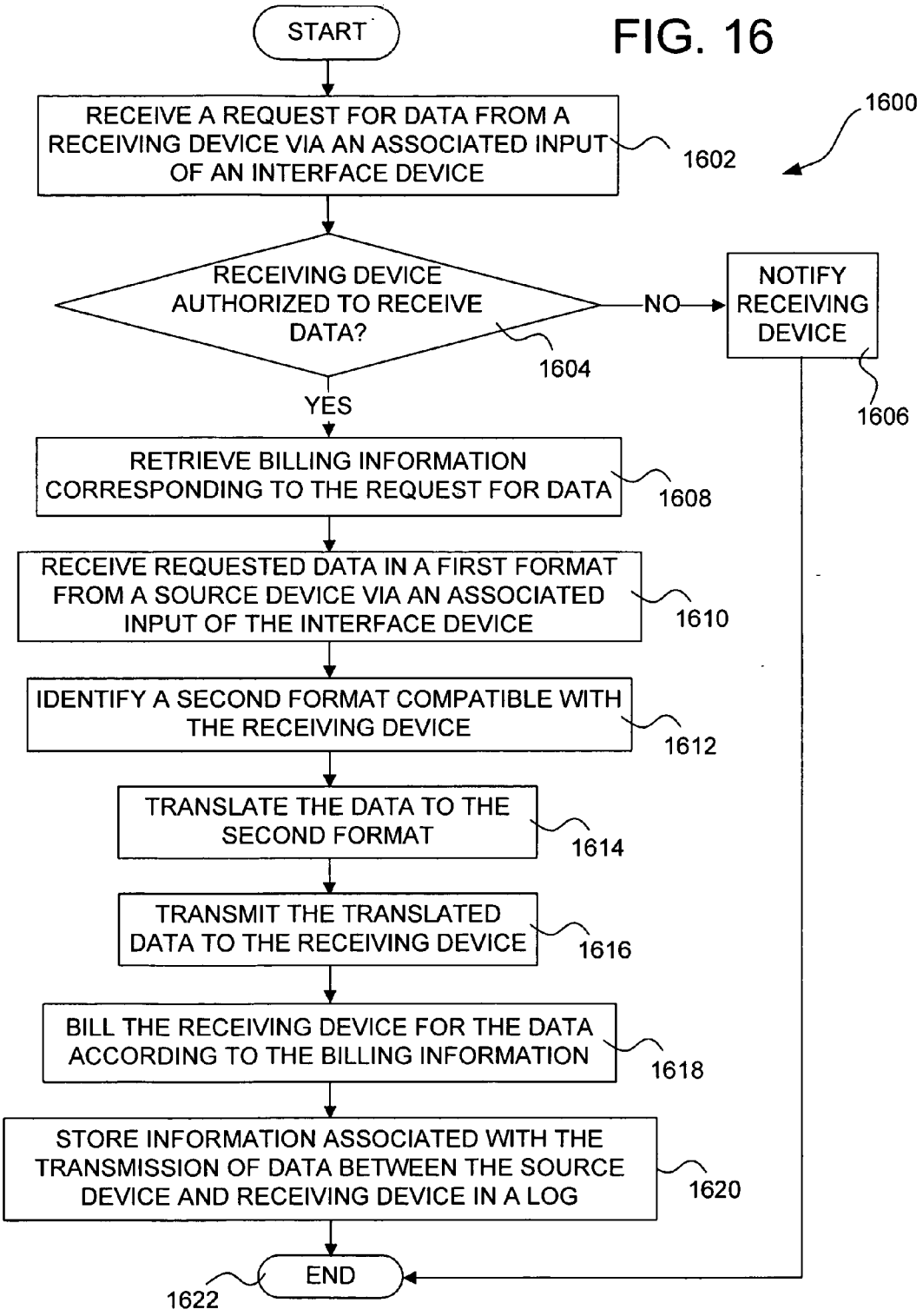

1500
START
RECEIVE DATA IN A FIRST FORMAT FROM A COMMUNICATIONS NETWORK VIA A RELAY DEVICE
1502
TRANSMIT THE DATA TO AN INTERFACE CONTROLLER
1504
IDENTIFY A DEVICE TO RECEIVE THE DATA
1506
IDENTIFY A SECOND FORMAT COMPATIBLE WITH A COMMUNICATIONS NETWORK ASSOCIATED WITH THE IDENTIFIED DEVICE
1508
FIRST FORMAT SAME AS SECOND FORMAT?
1510
NO
YES
TRANSLATE DATA FROM FIRST FORMAT TO SECOND FORMAT
1512
TRANSMIT DATA TO IDENTIFIED DEVICE VIA THE ASSOCIATED COMMUNICATIONS NETWORK
1514
END
1516

FIG. 16


START
RECEIVE A REQUEST FOR DATA FROM A RECEIVING DEVICE VIA AN ASSOCIATED INPUT OF AN INTERFACE DEVICE
1602
1600
RECEIVING DEVICE AUTHORIZED TO RECEIVE DATA?
1604
NO
NOTIFY RECEIVING DEVICE
1606
YES
RETRIEVE BILLING INFORMATION CORRESPONDING TO THE REQUEST FOR DATA
1608
RECEIVE REQUESTED DATA IN A FIRST FORMAT FROM A SOURCE DEVICE VIA AN ASSOCIATED INPUT OF THE INTERFACE DEVICE
1610
IDENTIFY A SECOND FORMAT COMPATIBLE WITH THE RECEIVING DEVICE
1612
TRANSLATE THE DATA TO THE SECOND FORMAT
1614
TRANSMIT THE TRANSLATED DATA TO THE RECEIVING DEVICE
1616
BILL THE RECEIVING DEVICE FOR THE DATA ACCORDING TO THE BILLING INFORMATION
1618
STORE INFORMATION ASSOCIATED WITH THE TRANSMISSION OF DATA BETWEEN THE SOURCE DEVICE AND RECEIVING DEVICE IN A LOG
1620
END
1622

APPARATUS AND METHOD FOR AGGREGATING AND ACCESSING DATA ACCORDING TO USER INFORMATION

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This patent application is a Continuation-In-Part Patent Application of each of the following copending U.S. Patent Applications: U.S. patent application Ser. No. 09/999,806, entitled "Cellular Docking Station," filed on Oct. 24, 2001 which is a continuation of U.S. Pat. No. 6,480,714, entitled "Cellular Docking Station," filed on Jul. 30, 1998 which claims priority to U.S. Provisional Application No. 60/054,238, entitled "Cellular Docking Station," filed on Jul. 30, 1997; and U.S. patent application Ser. No. 10/195,197, entitled "System and Method for Interfacing Plain Old Telephone System (POTS) Devices with Cellular Networks," filed on Jul. 15, 2002. Each of the U.S. Patent Applications listed in this section is herein incorporated by reference in its entirety.

[0002] This patent application is related to the following copending U.S. Patent Applications: U.S. patent application Ser. No. 10/929,715, entitled "Systems and Methods for Interfacing Telephony Devices with Cellular and Computer Networks," filed on Aug. 30, 2004; U.S. patent application Ser. No. 10/929,712, entitled "System and Method for Interfacing Plain Old Telephone System (POTS) Devices with Cellular Devices in Communication with a Cellular Network," filed on Aug. 30, 2004; U.S. patent application Ser. No. 10/929,711, entitled "Systems and Methods for Restricting the Use and Movement of Telephony Devices," filed on Aug. 30, 2004; U.S. patent application Ser. No. 10/929,317, entitled "Systems and Methods for Passing Through Alternative Network Device Features to Plain Old Telephone System (POTS) Devices," filed on Aug. 30, 2004; U.S. patent application Ser. No. _____, entitled "Cellular Docking Station," filed on or about the same day as the present application and assigned Attorney Docket No. 190250-1502/BLS96042CON2; U.S. patent application Ser. No. _____, entitled "Apparatus, Method, and Computer-Readable Medium for Interfacing Communications Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5000US01/BLS050358; U.S. patent application Ser. No. _____, entitled "Apparatus, Method, and Computer-Readable Medium for Interfacing Devices with Communications Networks," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5001US01/BLS050359; U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Providing a User Interface for Facilitating Communications Between Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5002US01/BLS050360; U.S. patent application Ser. No. _____, entitled "Apparatus, Method, and Computer-Readable Medium for Securely Providing Communications Between Devices and Networks," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5003US01/BLS050361; U.S. patent application Ser. No. _____, entitled "Plurality of Interface Devices for Facilitating Communications Between Devices and Communications Networks," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5004US01/BLS050362; U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Providing Communications and Connection-Oriented Services to Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5005US01/BLS050363; U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Prioritizing Communications Between Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5006US01/BLS050364; U.S. patent application Ser. No. _____, entitled "Apparatus, Method, and Computer-Readable Medium for Communication Between and Controlling Network Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5007US01/BLS050365; U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Restricting Access to Data," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5009US01/BLS050367; U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Providing Emergency and Alarm Communications," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5010US01/BLS050368; and U.S. patent application Ser. No. _____, entitled "Apparatus and Method for Testing Communication Capabilities of Networks and Devices," filed on Dec. 30, 2005 and assigned Attorney Docket No. 60027.5011US01/BLS050369. Each of the U.S. Patent Applications listed in this section is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0003] The exemplary embodiments relate generally to telecommunications and, more particularly, to an apparatus and method for aggregating and accessing data according to user information.

BACKGROUND

[0004] Emerging communications network protocols and solutions, such as Voice over Internet Protocol (VoIP) and WI-FI, allow individuals to use VoIP and WI-FI compatible devices to communicate with each other over wide area networks, such as the Internet, in the same manner in which they currently communicate over the Public Switched Telecommunications Network (PSTN). However, in most instances, owners of legacy devices such as cellular telephones and Plain Old Telephone System (POTS) devices which are compatible with cellular networks and the PSTN are not capable of interfacing these devices to networks associated with the emerging communications network protocol and solutions. Thus, legacy device owners are inconvenienced by having multiple devices that lack functionality with the emerging communications network protocols and solutions. Owners of legacy devices cannot convert data sent via the emerging communications network protocols and solutions to formats compatible with the legacy devices. Moreover, legacy devices cannot collect, store, and aggregate various types of data, or provide a secure central repository for personal data.

SUMMARY

[0005] In accordance with exemplary embodiments, the above and other problems are solved by providing an apparatus and method for aggregating and accessing data according to user information. According to one aspect, an interface device provides data between a first device and a second device. The interface device has an input for receiving data in a first format from at least the first device. The interface device has a repository for storing the data. Logic within the interface device is configured to receive a request for accessing the data stored in the repository and identify the second device for receiving the data. The logic identifies a second format that is compatible with the second device and trans-

lates the data to the second format. The interface device further has an output for transmitting the translated data to the second device. The logic may be further configured for aggregating data stored within the repository for transmission to a requesting device. The input may be a product identification input device such as a Radio Frequency Identity (RFID) proximity reader or an optical bar code reader. Additionally, the data received by the interface device may be financial information associated with a user. A security agent is operative to restrict access to the financial data.

[0006] According to a further aspect, an interface device provides data between a first device and a second device. The interface device has a repository for storing personal data associated with at least one user. The interface device has an input for receiving the personal data in a first format from the first device. Logic within the interface device is configured for receiving a request for accessing the personal data and identifying the second device for receiving the personal data. The logic identifies a second format that is compatible with the second device and translates the data to the second format. The logic is further configured for determining whether the second device is authorized to receive the personal data prior to transmitting the translated personal data to the second device. This authorization may be based on the identity of the second device or the identity of a user associated with the second device. The interface device has an output for transmitting the translated data to the second device if the second device is authorized to receive the personal data.

[0007] According to yet another aspect, a method provides for exchanging data between a first device and a second device. The method includes receiving a request for the data from the second device via a second input of an interface device. Billing information corresponding to the request for the data from the second device is received at the interface device. The first input of the interface device receives the requested data in a first format from the first device. A second format that is compatible with the second device is identified. The data is translated to the second format and transmitted to the second device. The second device is then billed for the data according to the billing information. The billing information may comprise a billing amount based on the characteristics of the data requested or based on a subscription associated with the second device.

[0008] The above-described aspects may also be implemented as a computer-controlled apparatus, a computer process, a computing system, an apparatus, or as an article of manufacture such as a computer program product or computer-readable medium. The computer program product may be a computer storage media readable by a computer system and encoding a computer program of instructions for executing a computer process. The computer program product may also be a propagated signal on a carrier readable by a computing system and encoding a computer program of instructions for executing a computer process.

[0009] These and various other features as well as advantages, which characterize exemplary embodiments, will be apparent from a reading of the following detailed description and a review of the associated drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Many exemplary embodiments can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the exemplary embodiments. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0011] FIG. **1** is a block diagram showing a conventional POTS connection to a telephone company through a network interface device;

[0012] FIG. **2** is a block diagram showing one illustrative embodiment of the system for interfacing POTS devices with cellular networks;

[0013] FIG. **3** is a block diagram showing one illustrative embodiment of the interface of FIG. **2**;

[0014] FIG. **4** is a block diagram showing one illustrative embodiment of the hardware within the interface of FIG. **3**;

[0015] FIG. **5** is a flowchart showing one illustrative embodiment of the method for interfacing POTS devices with cellular networks;

[0016] FIGS. **6**A and **6**B are flowcharts showing one illustrative embodiment of the method associated with the conversion of cellular network compatible signals to POTS compatible signals;

[0017] FIGS. **7**A and **7**B are flowcharts showing another illustrative embodiment of the method associated with the conversion of cellular network compatible signals to POTS compatible signals;

[0018] FIG. **8** is a flowchart showing several steps associated with the conversion of POTS compatible signals to cellular network compatible signals;

[0019] FIGS. **9** through **12** are flowcharts showing several illustrative embodiments of the method associated with the conversion of POTS compatible signals to cellular network compatible signals;

[0020] FIG. **13** is a block diagram showing an alternative illustrative embodiment of the interface device;

[0021] FIG. **14** is a flowchart showing an illustrative embodiment of the method and computer-readable medium associated with providing bi-directional communications between a first device and a second device;

[0022] FIG. **15** is a flowchart showing an illustrative embodiment of the method and computer-readable medium associated with interfacing devices with communications networks; and

[0023] FIG. **16** is a flowchart showing an illustrative embodiment of the method for exchanging data between communications devices and billing for the data.

DETAILED DESCRIPTION

[0024] Reference will now be made in detail to the description. While several illustrative embodiments will be described in connection with these drawings, there is no intent to limit it to the illustrative embodiment or illustrative embodiments disclosed therein. On the contrary, the intent is to cover all alternatives, modifications, and equivalents included within the spirit and scope of the embodiments as defined by the claims.

[0025] FIG. **1** is a block diagram showing a conventional POTS connection to a PSTN **110** through a Network Interface Device (NID) **140**. As such connections are well understood by those skilled in the art, only a cursory discussion is presented here. As shown in FIG. **1**, several POTS devices **140**, **150** occupy a location **120** (e.g., home, business, etc.). Each POTS device **140**, **150** is connected to the NID **140** by two-conductor pair wires **130***b*, **130***c*, also known as POTS pairs, or twisted pairs. The NID **140** serves as the interface between the POTS devices **140**, **150** and the PSTN **110**, wherein the

NID **140** is connected to the PSTN **110** through at least a two-conductor pair **130***a* or landline **130***a*. As evident from FIG. **1**, if the landline **130***a* is severed, or if the landline **130***a* is unavailable due to geographical limitations, then the POTS devices **140**, **150** within the location **120** have no connection to the PSTN **110**.

[0026] FIG. **2** is a block diagram showing one illustrative embodiment of a system for interfacing POTS devices **140**, **150** with cellular networks. As shown in FIG. **2**, one or more POTS devices **140**, **150** occupy a location **120**. However, unlike FIG. **1**, the POTS devices **140**, **150** in FIG. **2** are configured to communicate with at least one cellular tower **250** through an interface device **240**, thereby permitting connection between the POTS devices **140**, **150** and a cellular network. In this sense, the POTS devices **140**, **150** are connected to the interface device **240**, rather than an NID **140** (FIG. **1**), by two-conductor pair wires **130***d*, **130***e*. Since the interface device **240** is a bridge between the POTS devices **140**, **150** and the cellular network, the interface device **240** is configured to receive POTS compatible signals from the POTS devices **140**, **150** and convert the POTS compatible signals to cellular network compatible signals, which are transmitted from the interface device **240** to the cellular tower **250**. Additionally, the interface device **240** is configured to receive cellular network compatible signals from the cellular tower **250** and convert the cellular network compatible signals to POTS compatible signals, which are then forwarded to the POTS devices **140**, **150** for use within the location **120**. While a specific PSTN network is not shown in FIG. **2**, it will be clear to one of ordinary skill in the art that the cellular tower **250** may be connected to a PSTN network, thereby permitting communication with other PSTN devices.

[0027] FIG. **3** is a block diagram showing, in greater detail, a preferred illustrative embodiment of the interface device **240** of FIG. **2**. In the preferred illustrative embodiment, the cellular network compatible signals are transmitted and received at the interface device **240** by a cellular telephone **305** while the POTS compatible signals are transmitted and received at the interface device **240** through a POTS connector **380**, such as an RJ11 connector **380**. Thus, in the preferred illustrative embodiment, the interface device **240** comprises a cellular phone docking station **310** that is configured to interface with the cellular telephone **305**, thereby establishing a communications link with the cellular telephone **305**. The cellular phone docking station **310** may also have a tuned antenna **320** that is configured to improve transmission and reception by the cellular telephone **305**, thereby providing a more robust connection to the cellular network through the cellular tower **250** (FIG. **2**). The tuned antenna **320** may be coupled to a cellular telephone antenna **315** in a non-destructive, non-contact, or capacitative manner, for example, using capacitative coupling **325**, as shown in FIG. **3**. In addition to interfacing with a cellular telephone **305** through one of a variety of conventional connectors (not shown), the cellular phone docking station **310** is configured to receive signaling data through signaling line **355**, which may include commands associated with outgoing telephone calls. Thus, in one illustrative embodiment, the signaling data on signaling line **355** may be indicative of a telephone number.

[0028] The received signaling data on signaling line **355** is conveyed to the cellular telephone **305** by the cellular phone docking station **310**, thereby permitting control over certain operations of the cellular telephone **305** using the signaling data on signaling line **355**. In conveying the signaling data on signaling line **355**, the cellular phone docking station **305** may modify the signaling data on signaling line **355** appropriately (e.g., amplify, attenuate, reformat, etc.), or, alternatively, the cellular phone docking station **305** may relay the signaling data on signaling line **355** without modification. Regardless of whether or not the signaling data on signaling line **355** is modified, several aspects of the conveyed signal are discussed below, in greater detail, with reference to other components **350** associated with the interface device **240**. Although the term line is used to describe various non-limiting embodiments, one skilled in the art will be aware that in some embodiments a line carrying signals may be a path on a separate communication media from other signals while the line carrying signals in other embodiments may be a path on a communications media into which many different signals are multiplexed using various multiplexing techniques understood to one of ordinary skill in the art. Furthermore, in other embodiments, the signals may be carried by wireless communication media.

[0029] In addition to the cellular phone docking station **310**, the interface device **240** comprises an interface controller **370**, an audio relay **365**, a tone generator **375**, and a power supply **335**. The audio relay **365** is configured to exchange analog-audio signals **345** between the POTS devices **140**, **150** (FIG. **2**) and the cellular phone docking station **310**. In this sense, for incoming analog-audio signals **345** (i.e., audio from the cellular telephone **305** to the POTS devices **140**, **150** (FIG. **2**), the audio relay **365** receives analog-audio signals **345** from the cellular phone docking station **310** and transmits the analog-audio signals **345** to the POTS devices **140**, **150** (FIG. **2**) through the POTS connector (e.g., RJ11 connector) **380**. Similarly, for outgoing analog-audio signals **345** (i.e., audio from the POTS devices **140**, **150** (FIG. **2**) to the cellular telephone **305**), the analog audio signals **345** are received by the audio relay **365** through the POTS connector **380** and transmitted to the cellular phone docking station **310**. Thus, the audio relay **365** provides a bi-directional communication link for the analog-audio signals **345** between the POTS devices **140**, **150** (FIG. **2**) and the cellular phone docking station **310**. In a preferred illustrative embodiment, the audio relay **365** is also configured to either amplify or attenuate the analog-audio signals **345** in response to audio-control signals **385** generated by the interface controller **370**. Thus, the behavior of the audio relay **365** is governed by the interface controller **370**, which is discussed in greater detail below.

[0030] The tone generator **375** is configured to generate certain tones that are used by the POTS devices **140**, **150** (FIG. **2**). For example, when there is an incoming telephone call, the POTS devices **140**, **150** (FIG. **2**) "ring" to indicate the presence of the incoming telephone call. The tone generator **375**, in such instances, is configured to generate a ring tone, which is then transmitted to the POTS devices **140**, **150** (FIG. **2**) through the POTS connector **380**. The transmitted ring tone indicates to the POTS devices **140**, **150** (FIG. **2**) that they should "ring," thereby notifying the user of the incoming telephone call. The ring tone is generated in response to a ring enable signal on ring enable line **395**, which is discussed below with reference to the interface controller **370**.

[0031] In another example, when a user picks up a POTS telephone **140** (FIG. **2**), a dial-tone is produced at the POTS telephone **140** (FIG. **2**). The tone generator **375** is configured to generate the dial tone and transmit the generated dial tone to the POTS telephone **140** (FIG. **2**). The dial tone is gener-

ated in response to a dial enable signal on dial enable line **390**, which is also discussed below with reference to the interface controller **370**.

[0032] The power supply **335** is configured to provide the components of the interface device **240** with the requisite power. In this sense, the power supply **335** is connected to an external power supply **330** from which it receives external power. The external power is converted by the power supply **335** to a DC voltage, which is used to power the cellular phone docking station **310**, the tone generator **375**, the interface controller **370**, and any other device in the interface device **240** that may be powered by a DC source.

[0033] The interface controller **370** is configured to control the behavior of the audio relay **365**, the tone generator **375**, and the cellular phone docking station **310** during the conversion of POTS compatible signals to cellular network compatible signals, and vice versa. Thus, when an outgoing telephone call is placed by one of the POTS devices **140**, **150** (FIG. **2**), the interface controller **370** receives the dialed numbers and converts the dialed numbers to a digital command. The digital command is transmitted as signaling data on signaling line **355** from the interface controller **370** to the cellular phone docking station **310**, which, in turn, transmits the signaling data on signaling line **355** to the cellular telephone **305**. The signaling data, therefore, **355** instructs the cellular telephone **305** to dial the number. In one illustrative embodiment, when the number has been dialed and the called party picks up the phone, the cellular telephone **305** detects the connection and conveys an analog-audio signal **345** to the audio relay **365**. In this illustrative embodiment, the audio relay **365** subsequently indicates to the interface controller **370** that the call is connected, and the interface controller **370** generates an audio-control signal **385**, thereby enabling bi-directional audio communication of analog-audio signals **345** (i.e., talking between the connected parties) through the audio relay **365**. If the party on the POTS telephone **140** (FIG. **2**) disconnects (i.e., hangs up the phone), then the disconnect is detected by the interface controller **370** through the POTS connector **380**. In this illustrative embodiment, the interface controller **370** generates another audio-control signal **385** in response to the disconnect, thereby disabling the audio relay **365** and terminating the bi-directional audio communication between the POTS telephone **140** (FIG. **2**) and the cellular telephone **305**. The interface controller **370** further generates, in response to the disconnect, signaling data on signaling line **355**, which instructs the cellular telephone **305** to stop transmission and reception. If, on the other hand, the cellular telephone **305** disconnects, then this is detected by the audio relay **365** in one illustrative embodiment. The audio relay **365**, in turn, transmits the disconnect information to the interface controller **370**, and the interface controller **370** subsequently generates the audio-control signal **385** to disable the audio relay **365**.

[0034] In another illustrative embodiment, information relating to the connected call is transmitted to the interface controller **370** as signaling data on signaling line **355**, rather than as an analog-audio signal **345**. In this illustrative embodiment, the cellular telephone **305** generates signaling data on signaling line **355** when the connection is established. The signaling data on signaling line **355** is received by the interface controller **370**, which generates an audio-control signal **385** in response to the received signaling data on signaling line **355**. The audio-control signal **385** enables the audio relay **365**, thereby permitting bi-directional audio communication between the POTS telephone **140** (FIG. **2**) and the cellular telephone **305**. If the party on the POTS telephone **140** (FIG. **2**) disconnects (i.e., hangs up the phone), then the disconnect is detected by the interface controller **370** through the POTS connector **380**. The interface controller **370** subsequently generates an audio-control signal **385** to disable the audio relay **365**, thereby terminating the bi-directional audio communication between the POTS telephone **140** (FIG. **2**) and the cellular telephone **305**. If, however, the cellular telephone **305** disconnects, then the cellular telephone **305**, in this illustrative embodiment, generates signaling data on signaling line **355** indicative of the disconnected call. The generated signaling data on signaling line **355** is transmitted to the interface controller **370**, which subsequently generates an audio-control signal **385** to disable the audio relay **365**.

[0035] In the case of an incoming telephone call, the cellular telephone **305** detects the incoming telephone call and conveys this information to the interface controller **370**. In one illustrative embodiment, the information is conveyed to the interface controller **370** through the audio relay **365**. Thus, in this illustrative embodiment, the incoming telephone call generates an analog-audio signal **345** at the cellular telephone **305**. The analog-audio signal **345** is transmitted from the cellular telephone **305** to the audio relay **365** through the cellular phone docking station **310**, and the audio relay **365** then indicates to the interface controller **370** that there is an incoming call. The interface controller **370** receives this information and generates a ring enable signal on ring enable line **395**. The ring enable signal on ring enable line **395** is received by the tone generator **375**, which generates the ring tone in response to the ring enable signal on ring enable line **395**. The ring tone makes the POTS devices **140**, **150** (FIG. **2**) "ring." When one of the POTS device **140**, **150** (FIG. **2**) is picked up and a connection is established, the interface controller **370** detects the established call and generates signaling data on signaling line **355**, which indicates to the cellular telephone **305** that the connection is established. Additionally, the interface controller **370** generates an audio-control signal **385**, which enables the audio relay **365** for bi-directional audio communication between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305**. When the call ends, the system disconnects as described above.

[0036] In another illustrative embodiment, the information is conveyed to the interface controller **370** through signaling data on signaling line **355**. Thus, in this illustrative embodiment, when the cellular telephone **305** detects an incoming telephone call, it generates signaling data on signaling line **355**. The signaling data on signaling line **355** is transmitted to the interface controller **370**, thereby indicating that there is an incoming call. The interface controller **370** receives this information and generates a ring enable signal on ring enable line **395**. The ring enable signal on ring enable line **395** is received by the tone generator **375**, which generates the ring tone in response to the ring enable signal on ring enable line **395**. The tone makes the POTS devices **140**, **150** (FIG. **2**) "ring." When one of the POTS devices **140**, **150** (FIG. **2**) is picked up and a connection is established, the interface controller **370** detects the established call and generates signaling data on signaling line **355**, which indicates to the cellular telephone **305** that the connection is established. Additionally, the interface controller **370** generates an audio-control signal **385**, which enables the audio relay **365** for bi-directional audio communication between the POTS device **140**,

150 (FIG. **2**) and the cellular telephone **305**. When the call ends, the system disconnects as described above.

[0037] FIG. **4** is a block diagram showing the interface controller **370** of FIG. **3** in greater detail. The interface controller **370** is shown in FIG. **4** as comprising a processor **410**, random-access memory (RAM) **460**, read-only memory (ROM) **440**, Static-Random-Access Memory (SRAM) **450**, an off-hook/pulse sensor **430**, and a Dual-Tone Multi-Frequency (DTMF) decoder **420**. The ROM **440** is configured to store the instructions that run the interface controller **370**. In this sense, the ROM **440** is configured to store the program that controls the behavior of the interface controller **370**, thereby allowing the interface controller **370** to convert POTS compatible signals to cellular network compatible signals, and vice versa. The SRAM **450** is adapted to store configuration information, such as whether the system is amenable to 10-digit dialing or 7-digit dialing, international calling protocols, etc. Thus, the SRAM **450** may be adapted differently for systems that are used in different geographical areas, or systems that use different calling protocols. The RAM **460** is configured to store temporary data during the running of the program by the processor **410**. The processor is configured to control the operation of the off-hook/pulse sensor **430**, the DTMF decoder **420**, the tone generator **375**, and the audio relay **365** in accordance with the instructions stored in ROM **440**. Additionally, the processor **410** is configured to generate signaling data on signaling line **355**, which may instruct the cellular telephone **305** (FIG. **3**) to dial a number, disconnect a call, etc. Several of these functions are discussed in detail below with reference to the off-hook/pulse sensor **430** and the DTMF decoder **420**.

[0038] The off-hook/pulse sensor **430** is configured to detect when any of the POTS devices **140**, **150** (FIG. **2**) are off-hook and generate an off-hook signal **435** when a POTS device **140**, **150** (FIG. **2**) is detected as being off-hook. In this sense, the off-hook/pulse sensor **430** is connected to the POTS connector **380** (FIG. **3**) through the two-conductor pair wires **130***g*. Thus, when any of the POTS devices **140**, **150** (FIG. **2**) connected to the two-conductor pair **130** go off-hook, the off-hook is detected by the off-hook/pulse sensor **430**, which is also connected to the two-conductor pair **130**. The off-hook/pulse sensor **430** generates an off-hook signal **435** after detecting that a POTS device **140**, **150** (FIG. **2**) is off-hook, and subsequently transmits the off-hook signal **435** to the processor **410**. If the POTS device **140**, **150** (FIG. **2**) is receiving an incoming call, then the off-hook signal **435** indicates that the POTS device **140**, **150** (FIG. **2**) has "picked up" the incoming call, thereby alerting the processor **410** that the processor **410** should establish a bi-directional audio connection between the cellular telephone **305** (FIG. **3**) and the POTS device **140**, **150** (FIG. **2**). If, on the other hand, the POTS device **140**, **150** (FIG. **2**) is placing an outgoing call, then the off-hook signal **435** alerts the processor **410** that a phone number will soon follow. In either event, the off-hook/pulse sensor **430** transmits the off-hook signal **435** to the processor **410**, which, in turn, generates signaling data on signaling line **355** indicative of the POTS device **140**, **150** (FIG. **2**) being off-hook. The signaling data on signaling line **355** is then conveyed, either with or without modification, to the cellular telephone **305** through the cellular phone docking station **310**.

[0039] The off-hook/pulse sensor **430** is further configured to detect dialing from POTS devices **140**, **150** (FIG. **2**) that are configured for pulse dialing. Since pulse dialing emulates rapid sequential off-hook signals, the off-hook/pulse sensor **430** receives pulses (i.e., the rapid sequential off-hook signals) and produces a sequence of off-hook signals **435** or pulse-dialing signals. The sequence of off-hook signals **435** is relayed to the processor **410**, which converts the sequence of off-hook signals into signaling data on signaling line **355** that is indicative of the dialed number. The signaling data on signaling line **355** is transmitted from the processor **410** to the cellular telephone **305** through the cellular phone docking station **310**. The cellular telephone **305**, after receiving the signaling data on signaling line **355**, dials the number indicated by the signaling data on signaling line **355**, thereby permitting phone calls by the POTS devices **140**, **150** (FIG. **2**) through the cellular network. In one illustrative embodiment, the numbers dialed by the POTS devices **140**, **150** (FIG. **2**) are stored in RAM **460**, and, once a predetermined number of dialed numbers has been stored, the processor **410** conveys the stored numbers and a "send" command to the cellular telephone. In other words, upon receiving enough digits to dial a telephone number, as indicated by the configuration information in SRAM **450**, the processor **410** commands the cellular telephone **305** to dial the outgoing number, thereby connecting a call from the POTS device **140**, **150** (FIG. **2**) through the cellular network. In another illustrative embodiment, the RAM stores numbers as they are dialed by the POTS devices **140**, **150** (FIG. **2**). If, during dialing, the processor **410** detects a delay or a pause, then the processor **410** presumes that all of the digits of the telephone number have been dialed. Thus, the processor **410** commands the cellular telephone **305** to dial the outgoing number, thereby connecting the call from the POTS device **140**, **150** (FIG. **2**) through the cellular network.

[0040] The DTMF decoder **420** is configured to detect dialing from POTS devices **140**, **150** (FIG. **2**) that are configured for DTMF or "tone" dialing. The DTMF decoder **420** receives a tone, which represent a number, through the two-conductor pair **130***n*. After receiving the tone, the DTMF decoder **420** generates a DTMF-dialing signal **425** that is indicative of the number that was dialed. The DTMF-dialing signal **425** is then transmitted to the processor **410**, which converts the DTMF-dialing signal **425** into signaling data on signaling line **355** that is indicative of the number that was dialed. The signaling data on signaling line **355** is transmitted from the processor **410** to the cellular telephone **305** through the cellular phone docking station **310**. The cellular telephone **305** subsequently dials the number indicated by the signaling data on signaling line **355**, thereby allowing the POTS device **140**, **150** (FIG. **2**) to make a call using the cellular network.

[0041] It can be seen, from FIGS. **2** through **4**, that the various illustrative embodiments of the system will permit the interfacing of POTS devices **140**, **150** (FIG. **2**) with a cellular network. Specifically, in one illustrative embodiment, POTS devices **140**, **150** (FIG. **2**) are interfaced with the cellular network through a cellular telephone **305** (FIG. **3**), which is attached to the interface device **240** at a cellular phone docking station **310**. In addition to the various systems, as described above, another illustrative embodiment may be seen as a method for interfacing POTS devices **140**, **150** (FIG. **2**) with cellular networks. Several illustrative embodiments of the method are described with reference to FIGS. **5** through **12** below.

[0042] FIG. **5** is a flowchart showing one illustrative embodiment of the method for interfacing POTS devices with cellular networks. In a broad sense, once a POTS device **140**,

150 (FIG. 2) has been coupled to a cellular telephone 305 (FIG. 3) through an interface device 240 (FIG. 2), this illustrative embodiment may be seen as converting, in step 530, cellular network compatible signals from the cellular telephone 305 (FIG. 3) to POTS compatible signals, and converting, in step 540, POTS compatible signals from the POTS devices 140, 150 (FIG. 2) to cellular network compatible signals. In a preferred illustrative embodiment, the converting steps 530, 540 are performed at the interface device 240.

[0043] FIGS. 6A and 6B are flowcharts showing one illustrative embodiment of the method associated with the conversion 530 of cellular network compatible signals to POTS compatible signals. As an initial matter, the cellular network compatible signals are received through the cellular telephone 305 (FIG. 3). Thus, in step 610, the system receives an incoming call through the cellular telephone 305 (FIG. 3). Once the incoming call is received 610, the system further receives, in step 620, an analog-audio signal 345 (FIG. 3) indicative of the incoming call from the cellular telephone 305 (FIG. 3). The received analog-audio signal 345 (FIG. 3) is then transmitted, in step 630, to an interface controller 370 (FIG. 3). The interface controller 370 (FIG. 3) generates, in step 640, a ring tone in response to receiving the analog-audio signal 345 (FIG. 3). In a preferred illustrative embodiment, the ring tone is generated 640 by a tone generator 375 (FIG. 3). The generated 640 ring tone is conveyed, in step 650, to the POTS devices 140, 150 (FIG. 2), and, when the POTS device 140, 150 (FIG. 2) is "picked up," an off-hook signal is generated, in step 660, and conveyed, in step 670, to the interface controller 370 (FIG. 3). This triggers the interface controller 370 (FIG. 3) to activate the audio relay 365 (FIG. 3), and analog-audio signals 345 (FIG. 3) are exchanged, in step 680, between the POTS devices 140, 150 (FIG. 2) and the cellular telephone 305 (FIG. 3) through the audio relay 365 (FIG. 3). Thus, in this illustrative embodiment, once the incoming call is connected between the cellular telephone 305 (FIG. 3) and the POTS device 140, 150 (FIG. 2), the POTS device 140, 150 (FIG. 2) freely communicates through the cellular network.

[0044] FIGS. 7A and 7B are flowcharts showing another illustrative embodiment of the method associated with the conversion 530 of cellular network compatible signals to POTS compatible signals. Similar to FIGS. 7A and 7B, the cellular network compatible signals here are received through the cellular telephone 305 (FIG. 3). Thus, in step 710, the system receives an incoming call through the cellular telephone 305 (FIG. 3). However, unlike the illustrative embodiment of FIGS. 6A and 6B, once the incoming call is received 710, the system generates, in step 720, signaling data on signaling line 355 (FIG. 3) indicative of the incoming call from the cellular telephone 305 (FIG. 3). The generated 720 signaling data on signaling line 355 (FIG. 3) is then conveyed, in step 730, to an interface controller 370 (FIG. 3). The interface controller 370 (FIG. 3) generates, in step 740, a ring tone in response to signaling data on signaling line 355 (FIG. 3). In a preferred illustrative embodiment, the ring tone is generated 740 by a tone generator 375 (FIG. 3). The generated 740 ring tone is conveyed, in step 750, to the POTS devices 140, 150 (FIG. 2), and, when the POTS device 140, 150 (FIG. 2) is "picked up," an off-hook signal is generated, in step 760, and conveyed, in step 770, to the interface controller 370 RIG. 3). This triggers the interface controller 370 (FIG. 3) to activate the audio relay 365 (FIG. 3), and analog-audio signals 345 (FIG. 3) are exchanged, in step 780, between the POTS devices 140, 150 (FIG. 2) and the cellular telephone 305 (FIG. 3) through the audio relay 365 (FIG. 3). Thus, in this illustrative embodiment, once the incoming call is connected between the cellular telephone 305 (FIG. 3) and the POTS device 140, 150 (FIG. 2), the POTS device 140, 150 (FIG. 2) freely communicates through the cellular network.

[0045] FIG. 8 is a flowchart showing several steps associated with the conversion 540 of POTS compatible signals to cellular network compatible signals. As described above, the interface device 240 (FIG. 2) is configured to allow outgoing calls using either pulse-dialing or "tone" dialing. The method steps associated with pulse-dialing are different from the method steps associated with "tone" dialing. However, regardless of which type of dialing is employed, both methods share several of the initial steps. FIG. 8 describes the shared initial steps associated with an outgoing call from a POTS device 140, 150 (FIG. 2) through the cellular network. When a user "picks up" the phone 140 (FIG. 2) to place an outgoing call, the system detects, in step 810, an off-hook signal at the off-hook/pulse detector 430 (FIG. 4). The system then generates, in step 820, a dial tone in response to the detected off-hook signal. In an illustrative embodiment, the dial tone is generated 820 by the tone generator 375 (FIG. 3). The generated 820 dial tone is conveyed, in step 830, to the POTS device 140, 150 (FIG. 2) (i.e., to the person that is placing the outgoing call) to indicate that the system is ready for dialing. In addition to generating 820 the dial tone, the system further generates, in step 840, signaling data on signaling line 355 (FIG. 3) that is indicative of the POTS device 140, 150 (FIG. 2) being off-hook. The generated 840 signaling data on signaling line 355 (FIG. 3) is then conveyed, in step 850, to the cellular telephone 305 (FIG. 3), either with or without modification, through the cellular phone docking station 310 (FIG. 3), thereby indicating to the cellular telephone 305 (FIG. 3) that a user has "picked up" the phone 140 (FIG. 2), and that an outgoing call may be initiated. Thus, in one illustrative embodiment, once the cellular phone 305 (FIG. 3) receives the indication that the user has "picked up" the phone 140 (FIG. 2), the cellular telephone 305 (FIG. 3) blocks incoming calls. Hence, at this point, the system is ready for either pulse dialing or "tone" dialing. In another illustrative embodiment, the step of generating 840 signaling data on signaling line 355 (FIG. 3) may be completely.

[0046] FIGS. 9 and 10 are flowcharts showing several illustrative embodiments of the method associated with pulse dialing. As shown in FIG. 9, in one illustrative embodiment, the off-hook/pulse sensor 430 (FIG. 4) detects, in step 910, a pulse-dialing signal that is indicative of a pulse-dialed number. In response to the pulse-dialing signal, the processor 410 (FIG. 4) generates, in step 920, signaling data on signaling line 355 (FIG. 3) that is indicative of the pulse-dialed number and a "send" command. The signaling data on signaling line 355 (FIG. 3) is conveyed, in step 930, to the cellular telephone 305 (FIG. 3), either with or without modification (e.g., amplification or attenuation), by the processor 410 (FIG. 4) through the cellular phone docking station 310 (FIG. 3).

[0047] In one illustrative embodiment, the numbers dialed by the POTS devices 140, 150 (FIG. 2) are stored in RAM 460, and, once a predetermined number of dialed numbers has been stored, the processor 410 (FIG. 4) conveys the stored numbers and a "send" command to the cellular telephone 305 (FIG. 3). In other words, upon receiving enough digits to dial a telephone number, as indicated by the configuration information in SRAM 450 (FIG. 4), the processor 410 (FIG. 4) commands the cellular telephone 305 (FIG. 3) to dial the

outgoing number, thereby connecting a call from the POTS device **140**, **150** (FIG. **2**) through the cellular network. In another illustrative embodiment, the RAM **460** (FIG. **4**) stores numbers as they are dialed by the POTS devices **140**, **150** (FIG. **2**). If, during dialing, the processor **410** (FIG. **4**) detects a delay or a pause, then the processor **410** (FIG. **4**) presumes that all of the digits of the telephone number have been dialed. Thus, the processor **410** (FIG. **4**) commands the cellular telephone **305** to dial the outgoing number, thereby connecting the call from the POTS device **140**, **150** (FIG. **2**) through the cellular network. The command instructs the cellular telephone **305** (FIG. **3**) to call the number that has been conveyed to the cellular telephone **305** (FIG. **3**) by the signaling data on signaling line **355** (FIG. **3**).

[0048] When the called party "picks up" the phone, the system detects, in step **940**, an analog-audio signal **345** (FIG. **3**) that is indicative of the connected call. At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged, in step **950**, between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, once the outgoing call is connected between the cellular telephone **305** (FIG. **3**) and the POTS device **140**, **150** (FIG. **2**), the POTS device **140**, **150** (FIG. **2**) freely communicates through the cellular network.

[0049] In another illustrative embodiment, rather than waiting for the called party to "pick up" the phone, the system detects an analog-audio signal **345** (FIG. **3**) that is indicative of a called-party telephone ringing or a called-party telephone being "busy." At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, once a called-party telephone ringing or a called-party telephone "busy" signal is detected, the cellular telephone **305** (FIG. **3**) and the POTS device **140**, **150** (FIG. **2**) are connected through the cellular network.

[0050] FIG. **10** is a flowchart showing, in greater detail, another illustrative embodiment of the method associated with pulse dialing. As shown in FIG. **10**, the off-hook/pulse sensor **430** (FIG. **4**) detects, in step **910**, a pulse-dialing signal that is indicative of a pulse-dialed number. In response to the pulse-dialing signal, the processor **410** (FIG. **4**) generates, in step **920**, signaling data on signaling line **355** (FIG. **3**) that is indicative of the pulse-dialed number. The signaling data on signaling line **355** (FIG. **3**) is conveyed, in step **930**, to the cellular telephone **305** (FIG. **3**), either with or without modification, by the processor **410** (FIG. **4**) through the cellular phone docking station **310** (FIG. **3**). This instructs the cellular telephone **305** (FIG. **3**) to call the number that has been conveyed to the cellular telephone **305** (FIG. **3**) by the signaling data on signaling line **355** (FIG. **3**). When the called party "picks up" the phone, the cellular telephone **305** (FIG. **3**) generates signaling data on signaling line **355** (FIG. **3**) that is indicative of the connected call, and the processor detects, in step **1040**, the signaling data on signaling line **355** (FIG. **3**). At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged, in step **950**, between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, again, the POTS device **140**, **150** (FIG. **2**) freely communicates through the cellular network.

[0051] In another illustrative embodiment, rather than waiting for the called party to "pick up" the phone, the system detects an analog-audio signal **345** (FIG. **3**) that is indicative of a called-party telephone ringing or a called-party telephone being "busy." At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, once a called-party telephone ringing or a called-party telephone "busy" signal is detected, the cellular telephone **305** (FIG. **3**) and the POTS device **140**, **150** (FIG. **2**) are connected through the cellular network.

[0052] FIGS. **11** and **12** are flowcharts showing several illustrative embodiments of the method associated with "tone" dialing. As shown in FIG. **11**, in one illustrative embodiment, the DTMF decoder **420** (FIG. **4**) detects, in step **1110**, a DTMF signal that is indicative of a DTMF-dialed number. In response to the DTMF signal, the processor **410** (FIG. **4**) generates, in step **1120**, signaling data on signaling line **355** (FIG. **3**) that is indicative of the DTMF-dialed number. The signaling data on signaling line **355** (FIG. **3**) is conveyed, in step **1130**, to the cellular telephone **305** (FIG. **3**), either with or without modification, by the processor **410** (FIG. **4**) through the cellular phone docking station **310** (FIG. **3**). This instructs the cellular telephone **305** (FIG. **3**) to call the number that has been conveyed to the cellular telephone **305** (FIG. **3**) by the signaling data on signaling line **355** (FIG. **3**). When the called party "picks up" the phone, the system detects, in step **1140**, an analog-audio signal **345** (FIG. **3**) that is indicative of the connected call. At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged, in step **1150**, between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, once the incoming call is connected between the cellular telephone **305** (FIG. **3**) and the POTS device **140**, **150** (FIG. **2**), the POTS device **140**, **150** (FIG. **2**) freely communicates through the cellular network.

[0053] FIG. **12** is a flowchart showing another illustrative embodiment of the method associated with "tone" dialing. As shown in FIG. **12**, the DTMF decoder **420** (FIG. **4**) detects, in step **1110**, a DTMF signal that is indicative of a DTMF-dialed number. In response to the DTMF signal, the processor **410** (FIG. **4**) generates, in step **1120**, signaling data on signaling line **355** (FIG. **3**) that is indicative of the DTMF-dialed number. The signaling data on signaling line **355** (FIG. **3**) is conveyed, in step **1130**, to the cellular telephone **305** (FIG. **3**), either with or without modification, by the processor **410** (FIG. **4**) through the cellular phone docking station **310** (FIG. **3**). This instructs the cellular telephone **305** (FIG. **3**) to call the number that has been conveyed to the cellular telephone **305** (FIG. **3**) by the signaling data on signaling line **355** (FIG. **3**). When the called party "picks up" the phone, the cellular telephone **305** (FIG. **3**) generates signaling data on signaling line **355** (FIG. **3**) that is indicative of the connected call, and the processor detects, in step **1240**, the signaling data on signaling line **355** (FIG. **3**). At this point, the processor **410** (FIG. **4**) enables the audio relay **365** (FIG. **3**), and analog-audio signals **345** (FIG. **3**) are exchanged, in step **1150**, between the POTS device **140**, **150** (FIG. **2**) and the cellular telephone **305** (FIG. **3**). Thus, again, the POTS device **140**, **150** (FIG. **2**) freely communicates through the cellular network.

[0054] While several hardware components are shown with reference to FIGS. **3** and **4** to describe the interface controller **370**, it will be clear to one of ordinary skill in the art that the interface controller **370** may be implemented in hardware, software, firmware, or a combination thereof. In one illustra-

tive embodiment, the interface controller **370** (FIG. **3**) is implemented in software or firmware that is stored in a memory and that is executed by a suitable instruction execution system. If implemented in hardware, as in FIGS. **3** and **4**, the interface controller may be implemented with any or a combination of the following technologies: a discrete logic circuit having logic gates for implementing logic functions upon data signals, an Application Specific Integrated Circuit (ASIC) having appropriate combinational logic gates, a Programmable Gate Array (PGA), a Field Programmable Gate Array (FPGA), etc.

[0055] FIG. **13** is a block diagram showing a communications system **1300** including an interface device **1302** that is an alternative illustrative embodiment of the interface device **240** of FIG. **3**. According to this embodiment, the interface device **1302** provides additional functionality, allowing any number of devices and networks to communicate with any number of additional devices and networks. In doing so, the interface device **1302** acts as a gateway for information, receiving and translating data between various formats for transmission over any type of transmission medium. As used herein, data comprises audio, video, voice, text, images, rich media, and any combination thereof.

[0056] Turning now to FIG. **13**, the interface device **1302** provides communications between at least one of the devices **1358***a*, **1358***b* and at least one of the user devices **1322***a*-**1322***n*. Communications provided between the devices **1358***a*, **1358***b* and the user devices **1322***a*-**1322***n* via the interface device **1302** may include data comprising audio, video, voice, text, images, rich media, or any combination thereof. The devices **1358***a*, **1358***b* and the user devices **1322***a*-**1322***n* may include communications devices capable of sending and receiving communications including, but are not limited to, cellular telephones, VoIP phones, WI-FL phones, POTS phones, computers, Personal Data Assistants (PDAs), Digital Video Recorders (DVRs), and televisions. According to one embodiment, the devices **1358***a*, **1358***b* may be associated with communications networks **1320***a*, **1320***b* such that communications provided by the devices are sent via the communications networks, and communications directed to the devices are delivered via the communications networks. Similarly, the user devices may be associated with communications networks such that communications provided by the user devices are sent via the communications networks, and communications directed to the user devices are delivered via the communications networks as illustrated by the user devices **1356***a*, **1356***b* and the communications networks **1356***a*, **1356***b* in FIG. **13**. The communications networks **1320***a*, **1320***b* and **1356***a*, **1356***b* may include a wireless network such as, but not limited to, a Wireless Local Area Network (WLAN) such as a WI-FI network, a Wireless Wide Area Network (WWAN), a Wireless Personal Area Network (WPAN) such as BLUETOOTH, a Wireless Metropolitan Area Network (WMAN) such a Worldwide Interoperability for Microwave Access (WiMax) network, or a cellular network. Alternatively, the communications networks **1320***a*, **1320***b* and **1356***a*, **1356***b* may be a wired network such as, but not limited to, a wired Wide Area Network (WAN), a wired (Local Area Network) LAN such as the Ethernet, a wired Personal Area Network (PAN), or a wired Metropolitan Area Network (MAN).

[0057] The interface device **1302** may include at least one interface **1306** for communicating directly with the device **1358***b* and for communicating with the communications network **1320***b* associated with the device **1358***b*. It will be appreciated by those skilled in the art that the interface **1306** may comprise a wireline or wireless adapter for communicating with the device **1358***b* and with the communications network **1320***b*, which may include one of the wired or wireless networks described above. The interface **1306** may conform to a variety of wired network standards for enabling communications between the interface device **1302** and the device **1358***b* via a wired signaling connection **1364** and between the interface device and the communications network **1320***b* via a wired signaling connection **1342**. The interface **1306** may include, but is not limited to, a coaxial cable interface conformed to MPEG standards, POTS standards, and Data Over Cable Service Specifications (DOCSIS). The interface **1306** may also conform to Ethernet LAN standards and may include an Ethernet interface, such as an RJ45 interface (not shown). The interface **1306** may further include a twisted pair interface conformed to POTS standards, Digital Subscriber Line (DSL) protocol, and Ethernet LAN standards. Moreover, the interface **1306** may include a fiber optics interface conformed to Synchronous Optical Network (SONET) standards and Resilient Packet Ring standards. It will be appreciated that the interface **1306** may also conform to other wired standards or protocols such as High Definition Multimedia Interface (HDMI).

[0058] The interface **1306** may further conform to a variety of wireless network standards for enabling communications between the interface device **1302** and the device **1358***b* via a wireless signaling connection **1366** and between the interface device and the communications network **1320***b* associated with the device via a wireless signaling connection **1340**. The interface **1306** may include a cellular interface conformed to Advanced Mobile Phone System (AMPS) standards, Global System for Mobile Communications (GSM) standards, and Cellular Digital Packet Data (CDPD) standards for enabling communications between the interface device **1302** and the communications network **1320***b*. The interface **1306** may also include a WI-FI interface conformed to the 802.11x family of standards (such as 802.11a, 802.11b, and 802.11g). The interface **1306** may further include a WiMax interface conformed to the 802.16 standards. Moreover, the interface **1306** may include at least one of a satellite interface conformed to satellite standards or a receiver conformed to over-the-air broadcast standards such as, but not limited to, National Television System Committee (NTSC) standards, Phase Alternating Line (PAL) standards, and high definition standards. It will be appreciated that the interface **1306** may also conform to other wireless standards or protocols such as BLUETOOTH, ZIGBEE, and Ultra Wide Band (UWB). According to various embodiments, the interface device **1302** may include any number of interfaces **1306**, each conformed to at least one of the variety of wired and wireless network standards described above for receiving data in a variety of formats from multiple devices and networks via multiple transmission media.

[0059] In one embodiment, the interface device **1302** may communicate with the device **1358***a* and with the communications network **1320***a* associated with the device **1358***a* via a relay device **1324**. The relay device **1324** operates as a transceiver for the interface device **1302** to transmit and receive data to and from the device **1358***a* and the communications network **1320***a*. The relay device **1324** may modify the signaling data appropriately (e.g., amplify, attenuate, reformat, etc.), or, alternatively, the relay device **1324** may

relay the signaling data without modification. Additionally, the relay device **1324** may be fixed, or may be portable to provide a user with a remote means for accessing data from a network or other device via the interface device **1302**. Examples of fixed relay devices include, but are not limited to, a DSL modem, a cable modem, a set top device, and a fiber optic transceiver. Examples of portable relay devices include portable communications devices such as, but not limited to, a cellular telephone, a WI-FI telephone, a VoIP telephone, a PDA, a satellite transceiver, or a laptop.

[0060] The relay device **1324** may also include a combination of a fixed device and a portable device. For example, the relay device **1324** may comprise a cellular telephone in combination with a docking station. The docking station remains connected to the interface device **1302**, through wired or wireless means, while the cellular telephone may be removed from the docking station and transported with a user. In this embodiment, data received from the interface device **1302** at the cellular telephone may be taken with the user to be utilized at a remote location. While the cellular telephone is not docked with the docking station, communication would occur between the device **1358***a* and the interface device **1302** as well as between the communications network **1320***a* and the interface device via a direct connection or via an alternate relay device.

[0061] The device **1358***a* may provide data via signals, which are transmitted either over a wireless signaling connection **1360** or over a wired signaling connection **1362** directly to the relay device **1324**. Alternatively, the communications network **1320***a* associated with the device **1358***a* may provide data via signals, which are transmitted either over a wireless signaling connection **1332** or over a wired signaling connection **1336** to the relay device **1324**. The data may include audio, video, voice, text, rich media, or any combination thereof. Signals provided by the device **1358***a* over the wireless signaling connection **1360** to the relay device **1324** and signals provided by the communications network **1320***a* over the wireless signaling connection **1332** to the relay device may be in a format compatible with a cellular network, a WI-FI network, a WiMax network, a BLUETOOTH network, or a satellite network. Signals provided by the device **1358***a* over the wired signaling connection **1362** to the relay device **1324** and signals provided by the communications network **1320***a* over the wired signaling connection **1336** may be in a format compatible with a DSL modem, a cable modem, a coaxial cable set top box, or a fiber optic transceiver.

[0062] Once the relay device **1324** receives data from the device **1358***a* or from the communications network **1320***a*, the relay device may transmit the data to an interface **1304** associated with the interface device **1302** via a signal over a wireless signaling connection **1334** or a wired signaling connection **1338**. In one embodiment, the device **1358***a* and the communications network **1320***a* may communicate both directly with the interface device **1302** through the interface **1304** and with the interface device via the relay device **1324** through the interface **1304**. The interface **1304** may conform to a variety of wireless network standards for enabling communications between the interface device **1302** and the relay device **1324**. The interface **1304** may include a cellular interface conformed to AMPS, GSM standards, and CDPD standards for enabling communications between the interface device **1302** and the relay device **1324**. The interface **1304** may also include a WI-FI interface conformed to the 802.11x family of standards (such as 802.11a, 802.11b, and 802.11g). The interface **1304** may further include a WiMax interface conformed to the 802.16 standards. Moreover, the interface **1304** may include at least one of a cordless phone interface or a proprietary wireless interface. It will be appreciated by one skilled in the art that the interface **1304** may also conform to other wireless standards or protocols such as BLUETOOTH, ZIGBEE, and UWB.

[0063] The interface **1304** may also conform to a variety of wired network standards for enabling communications between the interface device **1302** and the relay device **1324**. The interface **1304** may include, but is not limited to, microphone and speaker jacks, a POTS interface, a USB interface, a FIREWIRE interface, a HDMI, an Enet interface, a coaxial cable interface, an AC power interface conformed to Consumer Electronic Bus (CEBus) standards and X.10 protocol, a telephone interface conformed to Home Phoneline Networking Alliance (HomePNA) standards, a fiber optics interface, and a proprietary wired interface.

[0064] Signals provided by the relay device **1324** over the wireless signaling connection **1334** to the interface **1304** may be in a format compatible with a cellular network, a WI-FI network, a WiMax network, a BLUETOOTH network, or a proprietary wireless network. Signals provided over the wired signaling connection **1338** to the interface **1304** may be in a format compatible with microphone and speaker jacks, a POTS interface, a USB interface, a FIREWIRE interface, an Enet interface, a coaxial cable interface, an AC power interface, a telephone interface, a fiber optics interface, or a proprietary wired interface.

[0065] Data received at the interfaces **1304**, **1306** either directly from the devices **1358***a*, **1358***b* and the communications networks **1320***a*, **1320***b* or via the relay device **1324** is provided to an interface controller **1308** via a signaling line **1316**. The interface controller **1308** is similar to the interface controller **370** of the interface device **240** described above with respect to FIG. **3**. Once the interface controller **1308** receives data from the devices **1358***a*, **1358***b* or the communications networks **1320***a*, **1320***b*, the interface controller **1308** identifies one or more of the user devices **1322***a*-**1322***n* and/or one or more of the communications networks **1356***a*, **1356***b* to receive the data, identifies a format compatible with the one or more receiving devices and/or receiving networks, and translates the current format of the data to the format compatible with the one or more receiving devices and/or receiving networks, which is further discussed below. After the data is translated, the interface controller **1308** provides the data to one or more of the interfaces **1326**, **1328**, and **1330** associated with the one or more devices and or networks identified to receive the translated data via a signaling line **1318**. For example, if the interface controller **1308** identifies a POTS telephone as the device to receive the translated data, then the interface controller provides the data via the signaling line **1318** to an interface compatible with POTS standards.

[0066] The interface controller **1308** is further configured to receive data from the user devices **1322***a*-**1322***n* and the communications networks **1356***a*, **1356***b*, identify one or more of the devices **1358***a*, **1358***b* and/or one or more of the communications network **1320***a*, **1320***b* to receive the data, identify a format compatible with the one or more receiving devices and/or receiving networks, and translate the current format of the data to the format compatible with the one or more receiving devices and/or receiving networks. Thus, the interface controller **1308** provides a bi-directional communi-

cation for all data transmitted between the devices **1358***a*, **1358***b* and the user devices **1322***a*-**1322***n*, between the devices **1358***a*, **1358***b* and the communications networks **1356***a*, **1356***b*, between the communications networks **1320***a*, **1320***b* and the user devices **1322***a*-**1322***n*, and between the communication networks **1320***a*, **1320***b* and the communications network **1356***a*, **1356***b*. In an illustrative embodiment, the interface controller **1308** is also configured to either amplify or attenuate the signals carrying the data transmitted between the communications networks and the devices.

[0067] The interfaces **1326**, **1328**, and **1330** may transmit the data to the user devices **1322***a*-**1322***n* directly, as illustrated by the interface **1330** in FIG. **13**, or the interfaces **1326**, **1328**, and **1330** may transmit the data to the communications networks **1356***a*, **1356***b* associated with the devices **1322***a*, **1322***b*, as illustrated by the interfaces **1326**, **1328** in FIG. **13**. In either case, the interfaces **1326**, **1328**, and **1330** transmit the data via a signal over wireless signaling connections **1346**, **1350**, and **1354** or wired signaling connections **1344**, **1348**, and **1352**, respectively. In another embodiment, one of the interfaces **1326**, **1328**, and **1330** may communicate the data to two or more of the devices **1322***a*-**1322***n* and/or communications networks **1356***a*, **1356***b*.

[0068] The interfaces **1326**, **1328**, and **1330** may conform to a variety of wireless network standards for enabling communications between the interface device **1302** and the devices **1322***a*-**1322***n* or the communications networks **1356***a*, **1356***b*. The interfaces **1326**, **1328**, and **1330** may include at least one cellular interface conformed to AMPS, GSM standards, and CDPD standards for enabling communications between the interface device **1302** and the devices **1322***a*, **1322***b*, and **1322***n*. The interfaces **1326**, **1328**, and **1330** may also include at least one WI-FL interface conformed to the 802.11x family of standards (such as 802.11a, 802.11b, and 802.11g). The interfaces **1326**, **1328**, and **1330** may further include at least one WiMax interface conformed to the 802.16 standards. Moreover, the interfaces **1326**, **1328**, and **1330** may include at least one of a cordless phone interface or a proprietary wireless interface. It will be appreciated by those skilled in the art that the interfaces **1326**, **1328**, and **1330** may also conform to other wireless standards or protocols such as BLUETOOTH, ZIGBEE, and UWB.

[0069] The interfaces **1326**, **1328**, and **1330** may also conform to a variety of wired network standards for enabling communications between the interface device **1302** and the devices **1322***a*-**1322***n* or the communications networks **1356***a*, **1356***b*. The interfaces **1326**, **1328**, and **1330** may include, but are not limited to, microphone and speaker jacks, a POTS interface, a USB interface, a FIREWIRE interface, a HDMI, an Enet interface, a coaxial cable interface, an AC power interface conformed to CEBus standards and X.10 protocol, a telephone interface conformed to HomePNA standards, a fiber optics interface, and a proprietary wired interface.

[0070] Signals provided by the interfaces **1326**, **1328**, and **1330** over the wireless signaling connections **1346**, **1350**, and **1354** may be in a-format compatible with a cellular network, a WI-FI network, a WiMax network, a BLUETOOTH network, or a proprietary wireless network. Signals provided over the wired signaling connections **1344**, **1348**, and **1352** may be in a format compatible with microphone and speaker jacks, a POTS interface, a USB interface, a FIREWIRE interface, a HDMI, an Enet interface, a coaxial cable interface, an AC power interface, a telephone interface, a fiber optics interface, or a proprietary wired interface.

[0071] For some interfaces such as, but not limited to, POTS interfaces, functionality of the interfaces that provide service from a network to a user device is different from the functionality of the interfaces that receive service from the network. Interfaces that deliver service from a network to a user device are commonly referred to as Foreign eXchange Subscriber (FXS) interfaces, and interfaces that receive service from the network are commonly referred to as Foreign eXchange Office (FXO) interfaces. In general, the FXS interfaces provide the user device dial tone, battery current, and ring voltage, and the FXO interfaces provide the network with on-hook/off-hook indications. In an embodiment, the interfaces **1326**, **1328**, and **1330** are the FXS interfaces that deliver data from the communications networks **1320***a*, **1320***b* to the user devices **1322***a*-**1322***n*, and the interfaces **1304**, **1306** are the FXO interfaces that receive data from the communications networks **1320***a*, **1320***b*.

[0072] As mentioned above, the interface controller **1308** may control the translation of the data received at the interface device **1302** from one format to another. In particular, the interface controller **1308** is configured to control the behavior of the relay device **1324** and any additional components necessary for translating data in order to effectuate the translation of the data from one format to another format. For example, as described above, for translating between POTS compatible signals and cellular network compatible signals, the interface controller **1302** may communicate with an audio relay and a tone generator, and includes an off-hook/pulse sensor and a DTMF decoder. The interface device **1302** shares the same capabilities for translating between POTS compatible signals and cellular network compatible signals as described above with regard to the interface device **240** illustrated in FIG. **3**, but the interface device **1302** also has additional translation capabilities for translating between any number and type of other signals. Consequently, the interface device **1302** may comprise any components necessary for a given translation.

[0073] According to one embodiment of the present invention, the interface controller **1308** comprises a processor **1372**, RAM **1374**, and non-volatile memory **1368** including, but not limited to, ROM and SRAM. The non-volatile memory **1368** is configured to store logic used by the interface controller **1308** to translate data received at the interface device **1302**. In this sense, the non-volatile memory **1368** is configured to store the program that controls the behavior of the interface controller **1308**, thereby allowing the interface controller **1308** to translate data signals from one format to another. The non-volatile memory **1368** is also adapted to store configuration information and may be adapted differently depending on geographical area and signal formats and protocols. The configuration information stored on the non-volatile memory **1368** of the interface controller **1308** may include default configuration information originally provided on the interface device **1302**. In another embodiment of the present invention, the configuration information stored on the non-volatile memory **1368** may include a user profile **1370** associated with one or more of the devices **1322***a*-**1322***n*, one or more of the communications networks **1356***a*, **1356***b*, or a combination thereof.

[0074] The user profile **1370** may include user preferences established by one or more users of the interface device **1302** regarding formats in which data is to be transmitted and received, translations to be performed on the data, the devices

and networks to send and receive the data, as well as any other configuration information associated with transmitting data via the interface device **1302**. The RAM **1374** is configured to store temporary data during the running of the program by the processor **1372**, allowing the RAM to operate as a memory buffer for times in which the data is being received at a rate that is faster than the interface device **1302** can determine a proper recipient, translate the data, and transmit the data to the proper recipient. The processor **1372** is configured to generate signaling data on the signaling line **1316**, which may instruct the relay device **1324** to dial a number, connect to a network, etc. The interface device **1302** may further include a mass storage **1388** such as a disk, tape, or optical storage. The mass storage **1388** is used for storing data from devices **1358***a*, **1358***b*, **1322***a*-**1322***n*, and from communications networks **1320***a*, **1320***b*, **1356***a*, and **1356***b*.

[0075] As mentioned above, the interface device **1302** contains logic within the interface controller **1308** that is used by the interface controller to translate data received at the interface device. The logic may include any number and types of data translation standards. In particular, the interface controller **1308** uses the logic to translate the data received at one of the interfaces **1304**, **1306**, **1326**, **1328**, **1330** of the interface device **1302** from at least one format to at least one other format. How the data received at the interface device **1302** is translated may be based on any one or combination of factors. According to one embodiment, the type of data translation may depend on the source and destination of the data. It should be understood that although the description contained herein describes the devices **1358***a*, **1358***b* and the communications networks **1320***a*, **1320***b* as the source devices and the source networks, respectively, and the user devices **1322***a*-**1322***n* and the communications networks **1356***a*, **1356***b* as the destination devices and the destination networks, respectively, embodiments contemplate data transfer from the user devices **1322***a*-**1322***n* and from the communications networks **1356***a*, **1356***b* to the devices **1358***a*, **1358***b* and to the communications networks **1320***a*, **1320***b* as well as bidirectional communication and data transfer. As an example, data arriving at the interface device **1302** that is directed to a POTS device would be translated to a format compatible for transmission over the appropriate medium associated with the POTS device.

[0076] According to another embodiment, the type of data translation may depend on default configuration information originally provided on the interface device **1302**. For example, the default configuration information may be provided by a service provider offering the interface device **1302** to customers. In yet another embodiment, the type of data translations may depend on a user profile **1370** stored on the interface device **1302**. As discussed above, the user profile **1370** may be configured by a user of the interface device **1302** to include user preferences regarding formats in which data is to be transmitted and received, translations to be performed on the data, the devices and networks to send and receive the data, as well as any other configuration information associated with transmitting data via the interface device **1302**.

[0077] When configuring the user profile **1370**, the user may specify the appropriate destination device, transmission medium, and filtering options for data received under any variety of circumstances. For example, the user may configure the interface device **1302** such that all incoming rich media content is translated for transmission to and display on the device **1322***b*, which, as discussed above, may include a television. The user might configure the interface device **1302** such that only media from specific websites be allowed to download to a device or network via the interface device **1302**. In doing so, the user profile **1370** might include access data such as a user name and password that will be required from the user prior to accessing a specific type or quantity of data. The user profile **1370** may additionally contain priorities for translation and transmission when multiple data signals and data formats are received at the interface device **1302**. For example, a user may specify that audio data be given transmission priority over other types of data. The priority may be based on a specific transmitting or receiving device, the type of transmitting or receiving device, the format of the data being transmitted or received, the transmission medium of the transmitting or receiving signals, or any other variable. As used herein, the format associated with the data may include a transmission medium associated with the signal carrying the data, a standard associated with the data, or the content of the data.

[0078] It should be understood by one skilled in the art that data translations as discussed above may include several different types of data conversion. First, translating data may include converting data from a format associated with one transmission medium to another transmission medium. For example, audio data from an incoming telephone call may be translated from a wireless, cellular signal to a twisted pair wiring signal associated with POTS telephones. Next, data translation may include converting data from one type to another, such as when voice data from a telephone or network is translated into text data for display on a television or other display device. For example, data translation may include, but is not limited to MPEG 2 translation to MPEG 4, or the reverse, Synchronized Multimedia Interface Language (SMIL) to MPEG 1, or Macromedia Flash to MPEG 4.

[0079] Additionally, data translation may include content conversion or filtering such that the substance of the data is altered. For example, rich media transmitted from one or more of the devices **1358***a*, **1358***b* or one or more of the communications networks **1320***a*, **1320***b* may be filtered so as to extract only audio data for transmittal to one or more of the user devices **1322***a*-**1322***n* or one or more of the communications networks **1356***a*, **1356***b*. Translation may further include enhancing the data, applying equalizer settings to the data, improving a poor quality signal carrying data based on, e.g., known characteristics of the device providing the data signal, degrading the data signal, or adding a digital watermark to the data to identify the device or the network associated with the data or the user sending the data. Translation may further include adding information to the data and annotating the data. Moreover, translation may include any combination of the above types of data conversions.

[0080] In one embodiment, data received at the interface controller **1308** may include a request for data. It should be understood that the request may be dialed telephone numbers, an IP address associated with a network or device, or any other communication initiating means. When a request for data is provided by one of the user devices **1322***a*-**1322***n*, the devices **1358***a*, **1358***b*, the communications networks **1320***a*, **1320***b*, or the communications networks **1356***a*, **1356***b*, the interface controller **1308** receives the request and converts the request to a digital command. The digital command is transmitted as signaling data either on the signaling line **1316** to one or more of the interfaces **1304**, **1306** or on the signaling line **1318** to one or more of the interfaces **1326**, **1328**, and

1330 based on the devices and/or communications networks identified to receive the request. Once received at one or more of the interfaces **1304**, **1306** or one or more of the interfaces **1326**, **1328**, and **1330**, the signaling data is transmitted to the destination devices and/or communications networks either directly or via the relay device **1324**. If the signaling data is transmitted to the relay device **1324**, the signaling data instructs the relay device to make the required connection to the identified devices **1358***a*, **1358***b* and/or the identified communications networks **1320***a*, **1320***b*.

[0081] When a connection is made between the device **1358***a* and one or more of the user devices **1322***a*-**1322***n*, between the device **1358***a* and one or more of the communications networks **1356***a*, **1356***b*, between the communications network **1320***a* and one or more of the user devices **1322***a*-**1322***n*, or between the communication network **1320***a* and one or more of the communications network **1356***a*, **1356***b* in response to a request for data, the relay device **1324** detects the connection and conveys a signal to the interface controller **1308**. In this illustrative embodiment, in response to receiving the signal from the relay device **1324**, the interface controller **1308** enables bi-directional communication of the requested data. If one of the devices and/or communications networks that requested the data disconnects, then the disconnect is detected by the interface controller **1308**. In this illustrative embodiment, the interface controller **1308** terminates the bi-directional communication by generating another signal, which instructs the relay device **1324** to stop transmission and reception of the data. If, on the other hand, the relay device **1324** disconnects, then this is detected by the interface controller **1308**, which, in response, terminates the bi-directional communication by stopping transmission and reception of the data.

[0082] While hardware components are shown with reference to FIG. **13** to describe the interface controller **370**, it will be clear to one of ordinary skill in the art that the interface controller **370** may be implemented in hardware, software, firmware, or a combination thereof. In one illustrative embodiment, the interface controller **1308** is implemented in software or firmware that is stored in a memory and that is executed by a suitable instruction execution system. If implemented in hardware, as in FIG. **13**, the interface controller **1308** may be implemented with any or a combination of the following technologies including, but not limited to, a discrete logic circuit having logic gates for implementing logic functions upon data signals, an ASIC having appropriate combinational logic gates, a PGA, a FPGA, other adaptive chip architectures, etc.

[0083] The power supply **1312** is configured to provide the components of the interface device **1302** with the requisite power similar to the power supply **335** discussed above in view of FIG. **3**. In this sense, the power supply **1312** is connected to an external power supply **1314** from which it receives external power. The external power is converted by the power supply **1312** to a DC voltage, which is used to power the components of interface device **1302** and optionally, the relay device **1324**.

[0084] Referring now to FIG. **14**, additional details regarding the operation of the interface device **1302** for providing communications between a first device and a second device will be discussed. It should be appreciated that the logical operations of the various embodiments are implemented (1) as a sequence of computer implemented acts or program modules running on a computing system and/or (2) as interconnected machine logic circuits or circuit modules within the computing system. The implementation is a matter of choice dependent on the performance requirements of the computing system implementing exemplary embodiments. Accordingly, the logical operations of FIG. **14** and other flow diagrams and making up the embodiments described herein are referred to variously as operations, structural devices, acts or modules. It will be recognized by one skilled in the art that these operations, structural devices, acts and modules may be implemented in software, in firmware, in special purpose digital logic, and any combination thereof without deviating from the spirit and scope of the exemplary embodiments as recited within the claims attached hereto.

[0085] The routine **1400** begins at operation **1402**, where data is received in a first format from a first device **1321**. The data is received at an interface **1304** of interface device **1302**. The interface device **1302** identifies a second device **1322** for receiving the data at operation **1404**. This identification may depend upon a user profile stored within the interface device **1302**. Alternatively, identifying a second device may comprise selecting a second device that is compatible with the signal type or transmission medium corresponding to the data received at interface **1304**. After identifying the second device **1322**, the interface device **1302** identifies a second format compatible with the second device **1322** at operation **1406**. Similarly, this process may be based on a user profile or on the characteristics of the second device **1322**. For example, the second device may be selected based on a user profile that instructs a POTS telephone to receive all media received at interface **1304**. Because the POTS telephone does not have the capability to display video, the interface device **1302** may identify the second format as containing only the audio portion of the received media.

[0086] At operation **1408**, the data is translated to the second format for transmittal to the second device **1322**. The data is then transmitted to the second device **1322** at operation **1410**. The communications capabilities of interface device **1302** are bidirectional. At operation **1412**, data is received in a second format from the second device **1322**. This data is translated to the first format at operation **1414**. After transmitting the translated data to the first device **1321** at operation **1416**, the routine **1400** continues to operation **1418**, where it ends.

[0087] Turning now to FIG. **15**, an illustrative routine **1500** will be described illustrating a process for interfacing devices with communications networks. The routine **1500** begins at operation **1502**, where the interface **1304** associated with the interface device **1302** receives data in a first format from the communications network **1320***a* via the relay device **1324**. As discussed above, the interface **1304** may conform to a variety of wireless or wired network standards such that the interface may receive a variety of types of data via a variety of types of signals.

[0088] Once the data is received at the interface **1304**, the routine **1500** continues to operation **1504**, where the data is transmitted via the signaling line **1316** to the interface controller **1308**. At operation **1506**, the interface controller **1308** identifies at least one of the devices **1322***a*-**1322***n* to receive the data from the communications network **1320***a*. As discussed above in view of FIG. **13**, the interface controller **1308** may identify which of the devices **1322***a*-**1322***n* should receive the data based on compatibility with the communications networks associated with each of the devices, a user profile stored on the interface device **1302**, or instructions

from the communications network **1320***a* that provided the data as to which of the devices should receive the data.

[0089] After the interface controller **1308** identifies at least one of the devices **1322***a*-**1322***n* to receive the data, the routine **1500** proceeds to operation **1508**, where the interface controller **1308** identifies a second format compatible with the communications network associated with the at least one device identified from the devices **1322***a*-**1322***n* to receive the data. The routine **1500** then proceeds to operation **1510**, where the interface controller **1308** determines whether the first format of the data is the same as the second format compatible with the communications network associated with the at least one device identified from the devices **1322***a*-**1322***n* to receive the data. If the formats are the same, then the routine **1500** proceeds to operation **1514**. If the formats are not the same, then the routine **1500** proceeds to operation **1512**, where the interface controller **1308** translates the data from the first format to the second format compatible with the communications network associated with the at least one device identified from the devices **1322***a*-**1322***n* to receive the data. The routine **1500** then proceeds to operation **1514**.

[0090] At operation **1514**, the interface controller **1308** transmits the data, whether translated or not, through at least one of the interfaces **1326**, **1328**, and **1330** associated with the at least one device identified from the devices **1322***a*-**1322***n* to the device identified from the devices **1322***a*-**1322***n* to receive the data via either a wireless or wired signaling connection. As discussed above with regard to FIG. **13**, the interfaces **1326**, **1328**, and **1330** may be conformed to a variety of wired and wireless network standards so that the interfaces can transmit a variety of types of data via a variety of types of signals. From operation **1514**, the routine **1500** continues to operation **1516**, where it ends.

[0091] According to one embodiment, the mass storage **1388** of the interface device **1302** provides a repository for data from the external communications devices and communications networks, **1358***a*, **1358***b*, **1322***a*-**1322***n*, **1320***a*, **1320***b*, **1356***a*, and **1356***b*, to which the interface device **1302** is attached. As discussed above, the mass storage **1388** may include disk, tape, or optical storage. It should be understood that the mass storage **1388** may be located within the interface device **1302** as shown in FIG. **13**, may be a peripheral device externally connected to the interface device **1302**, or may alternatively be located within the relay device **1324**. In the alternative embodiment in which the mass storage **1388** is located within the relay device **1324**, any functionality performed by the interface device **1302** as described herein may be performed by the relay device **1324** or may be performed by the interface device **1302** while accessing the mass storage **1388** located within the relay device. It should be understood that any type of data may be stored within mass storage **1388**. According to one illustrative embodiment, the data stored within the mass storage **1388** is directory information, including names, addresses, and telephone numbers of persons and businesses. With directory information stored within the interface device **1302**, the interface device may provide contact information as would be found in a typical telephone directory to any requesting device.

[0092] As a central repository for information, the interface device **1302** may receive and store personal data associated with at least one user. For example, the personal data may include credit card numbers, bank account numbers and related account information, personal access information for any device such as Personal Information Numbers (PINs) and passwords, or any other personal or confidential information. Because of the highly sensitive nature of this information, the interface device **1302** further includes a security agent for preventing unauthorized access to the information. The security agent may be any software or hardware mechanism for providing data security. As an example, the interface device **1302** may have a security program stored within the mass storage **1388** or non-volatile memory **1368** and executed by the logic within the processor **1374** that requires a user to provide authentication information prior to being allowed to access the information. The authentication information may be a user identification and corresponding password. This authentication information provided by the user is compared to authentication information stored within the mass storage **1388** or the non-volatile memory **1368**. If a match is found, the user is granted access to the requested personal information. If a match is not found, the user is denied access to the requested personal information. Alternatively, the interface device **1302** may utilize biometrics such as fingerprint, retinal scan, facial structure recognition, DNA, and voice spectral analysis to grant or deny access to the personal data stored within the mass storage **1388**.

[0093] The security agent may additionally or alternatively require authentication information associated with the device requesting access to the personal information stored within the mass storage **1388** prior to granting access. Rather than requiring a user to input a user identification and password, the security agent might compare identification information associated with the requesting device with a stored list of authorized device identifications to determine whether or not to grant access to the requested personal information. In this manner, access to sensitive information may be granted to anyone using an authorized device rather than basing access on a specific user. It should be appreciated that any number and type of security agents may be used to protect unauthorized access to the mass storage **1388**. It should also be appreciated that different users and different devices may be granted access to various levels of personal information. For example, parents may have access to all personal information including all credit card numbers and other means for making electronic payments while their children are given access to only a designated credit card.

[0094] The interface controller **1308** may be programmed to auto-populate payment information fields on any Internet website with payment information corresponding to the access authorization level corresponding to the specific user or device making the purchase. If User A were making a purchase and attempted to input payment information, then the interface device **1302** would only allow User A to input the payment information stored within the interface device that corresponds to the user identification and password entered by User A when the purchase commenced or when User A initiated access to the network via the interface device **1302**. By doing so, parents may exercise control over the purchases made on the Internet by their children.

[0095] According to another illustrative embodiment, the interface device **1302** is a central repository for data from a plurality of devices. Data is collected, stored, aggregated, and transmitted back to at least one device. As an example, each member of a family might keep a shopping list stored on their cellular telephone. The shopping lists are each stored on their respective telephones in a common format by a common client application stored on each cellular telephone. Logic within processor **1372** of the interface device **1302** receives

and stores each list. Each family member may connect his or her cellular telephone to the interface device **1302** through a wired connection such as a USB cable or a FIREWIRE cable, or through a wireless connection such as a BLUETOOTH connection or using a wireless SIM card. Alternatively, each family member can establish a connection with the interface device **1302** using a cellular network, either through a relay device **1324** or directly with the interface device **1302**.

[0096] Once connected to the interface device **1302**, each family member will upload his or her shopping list to the interface device **1302** for storage. When it is time for a family member to go shopping, he or she will request a master shopping list. The request may be made via a user interface provided by the client application, or via an interface such as a button or GUI located on the interface device **1302**. In response to the request, logic within the processor **1372** will aggregate each family member's list into a master list for the person doing the shopping. The master list is then transmitted to the requesting device, or transmitted to a designated printer for printing. In addition to aggregating the lists, it should be appreciated that the interface device **1302** may add to the data or may filter the data according to instructions stored within the user profile **1370** or according to the request for data. For example, a user may want the interface device **1302** to return data from only certain family members rather than all data from all family members. Additionally, a user may request only information stored since a selected date or during a selected time period.

[0097] The interface device **1302** may also provide this data collection, storage, and aggregation functionality in a manner that requires minimal user input such that the connection of the cellular telephone to the interface device **1302** and upload of data is transparent to the user. In this embodiment, the interface device **1302** detects each user's cellular telephone, establishes a communications link, and downloads data, all without any action required by the user. First, the interface device detects wireless devices as they enter within range of a wireless network. An example would be a network of BLUETOOTH devices. Each cellular telephone is configured such that they are detectable to the BLUETOOTH network when they move within range of the interface device **1302** or other device on the network. When the interface device **1302** detects a cellular telephone within range of the network, logic within the processor **1372** is configured to establish a connection to the telephone, request the shopping list or other applicable data, receive the data, and store the data in the mass storage **1388**. In this embodiment, the master shopping list may be continuously updated on a designated cellular telephone or other device as the family members update their respective lists. It should be understood that while the example discussed herein described the embodiment in terms of shopping lists and cellular telephones, the embodiment is equally applicable to any scenario in which data is input into the interface device **1302** from multiple external sources or repeatedly input by the same device and then aggregated, filtered, or amended before sending the data to requesting device.

[0098] According to another illustrative embodiment, the interface **1330** of interface device **1302** includes a product identification input device. In other words, the interface **1330** reads codes associated with a product in order to input product identification information into the interface device **1302**. Examples of product identification input devices include a Radio Frequency IDentity (RFID) proximity reader and an optical bar code reader. Following this example, device **1322***n* of FIG. **13** may be a plurality of products, each of which contains product identification information. Each product may be swiped in close proximity to the product identification input device in order to input the associated product identification information into the interface device **1302**. This information is then stored in the mass storage **1388** of the interface device **1302** where it is to be used by the interface device in accordance with a user request or programmed action. In practice, a user might scan the bar codes of products into the bar code reader interface **1330** of the interface device **1302** when the user wants to place the product on a shopping list. So, as a user finishes the peanut butter, he might scan the bar code located on the peanut butter jar into the interface device **1302** in order to add peanut butter to the shopping list. The interface device **1302** then reads the bar code and stores information associated with the bar code in the master shopping list located in the mass storage **1388**. As product information is scanned into the interface device **1302** for multiple products, the master shopping list is populated. The list may then be downloaded to a desired user device or printer as described above.

[0099] The interface device **1302** may further utilize data collection and aggregation features described above with the personal information securely stored within in order to make purchases from an Internet website or other network location or device associated with a network. Using the shopping list example discussed above, the processor **1372** may be programmed to make purchases from an Internet website according to a stored shopping list. The purchases or order may be programmed to be made on a specific date, at recurring intervals, or as initiated by a user. Using this feature, a user is able to easily consolidate purchase lists, add items to the lists, and be assured that purchases will be made in a timely manner with minimal user interaction.

[0100] The interface device **1302** may additionally contain billing information corresponding to information provided by the interface device to other devices. If a communications device accesses data from another device or a communications network via the interface device **1302**, then the user associated with the requesting device may be billed for that service. The billing information contains costs associated with the services provided to each device or user. Costs may be based on the type of data being accessed, the quality of the data transmission to the requesting device, the amount of data being accessed, a contract or subscription associated with the user or requesting device, or any combination thereof. Users may subscribe to various amounts and types of data for a fixed periodic fee.

[0101] FIG. **16** illustrates a routine **1600** for exchanging data between a first device and a second device and billing for the service. The routine begins at operation **1602** where a request for data from a receiving device is received via an input of an interface device **1302**. At operation **1604**, a determination is made as to whether the receiving device is authorized to receive the data. This determination may be whether the receiving device identification matches a device identification on an authorized receiving device list or whether a user identification and password associated with the receiving device matches a user identification and password on an authorized users list.

[0102] If the receiving device is determined to not be authorized to receive the requested data, then the routine proceeds to operation **1606** where the receiving device is notified and

the process ends at operation **1622**. If, however, the receiving device is determined to be authorized to receive the requested data, then the routine proceeds to operation **1608** where billing information corresponding to the request for data is retrieved. It should be understood that the billing information may be retrieved at any time during the routine prior to billing the receiving device. The routine **1600** proceeds to operation **1610** where the requested data is received in a first format from a source device via an input of the interface device **1302**. A second format compatible with the receiving device is identified at operation **1612**. The data is translated to the second format at operation **1614** and transmitted to the receiving device at operation **1616**. At operation **1618**, the receiving device is billed for the data according to the billing information retrieved at operation **1608**. Information associated with the transmission of data between the source device and the receiving device is stored in a log within the interface device **1302** at operation **1620**. This information may include the time and data of the transfer, the status of the transfer, the type of data transferred, the amount of data transferred, the amount billed to the receiving device for the transfer, and any other information pertaining to the exchange. The routine **1600** ends at operation **1622**.

[0103] It will be appreciated that exemplary embodiments provide methods, systems, apparatus, and computer-readable medium for interfacing devices with communications networks. Although the exemplary embodiments have been described in language specific to computer structural features, methodological acts and by computer readable media, it is to be understood that the exemplary embodiments defined in the appended claims are not necessarily limited to the specific structures, acts or media described. Therefore, the specific structural features, acts and mediums are disclosed as exemplary embodiments implementing the claimed invention.

[0104] The various embodiments described above are provided by way of illustration only and should not be construed to limit the invention. Those skilled in the art will readily recognize various modifications and changes that may be made without following the example embodiments and applications illustrated and described herein, and without departing from the true spirit and scope of the exemplary embodiments, which are set forth in the following claims.

What is claimed is:

1. An interface device for providing data between a first device and a second device, comprising:
- an input for receiving data in at least a first format from at least the first device;
- a repository for storing the data;
- logic configured for
  - receiving a request for accessing the data stored in the repository,
  - identifying the second device for receiving the requested data,
  - identifying a second format compatible with the second device, and
  - translating the data to the second format; and
- an output for transmitting the translated data to the second device.

2. The interface device of claim **1**, wherein the first device comprises a cellular telephone.

3. The interface device of claim **1**, wherein the request for accessing the data comprises a request for aggregating data from a plurality of devices, and wherein the logic is further configured for aggregating the data stored in the repository.

4. The interface device of claim **1**, wherein the input comprises a product identification input device.

5. The interface device of claim **4**, wherein the product identification input device is one of a Radio Frequency IDentity (RFID) proximity reader or an optical bar code reader.

6. The interface device of claim **4**, wherein the at least the first device comprises a plurality of products having identification means and wherein the data comprises product identification information associated with the identification means.

7. The interface device of claim **1**, wherein the data comprises financial information associated with a user and wherein the interface device further comprises a security agent operative to restrict access to the financial information.

8. The interface device of claim **1**, wherein the logic is further configured to receive the request for accessing data upon detection that the first device is located within a predefined proximity of the interface device.

9. The interface device of claim **8**, wherein the request for accessing data comprises a request for synchronizing data stored in the repository with data stored in the first device.

10. An interface device for providing personal data between a first device and a second device, comprising:
- a repository for storing personal data associated with at least one user;
- an input for receiving personal data in a first format from the first device;
- logic configured for
  - receiving a request for accessing the personal data,
  - identifying the second device for receiving the personal data,
  - identifying a second format compatible with the second device,
  - translating the personal data to the second format, and
  - determining whether the second device is authorized to receive the personal data prior to transmitting the translated data to the second device; and
- an output for transmitting the translated personal data to the second device if the second device is authorized to receive the data.

11. The interface device of claim **10**, wherein determining whether the second device is authorized to receive the data comprises receiving a device identification, comparing the received device identification with a stored device identification to determine whether the device identifications match, and if the device identifications match, authorizing the second device to receive the data.

12. The interface device of claim **10**, wherein determining whether the second device is authorized to receive the data comprises receiving a user identification and password associated with the at least one user, comparing the received user identification and password with a stored user identification and password to determine if the user identifications and passwords match, and if the user identifications and passwords match, authorizing the second device to receive the data.

13. The interface device of claim **10**, wherein the personal data comprises financial data.

14. The interface device of claim **13**, wherein the financial data comprises a credit card number.

15. The interface device of claim **10**, wherein the logic is further configured for transmitting the personal data to a third

device for storage and for transmitting the request to access the personal data to the third device.

16. A method for providing data between a first device and a second device, comprising:

receiving a request for the data from the second device via a second input of an interface device;

retrieving billing information corresponding to the request for the data from the second device;

receiving the requested data in a first format from the first device via a first input of the interface device;

identifying a second format compatible with the second device;

translating the data to the second format;

transmitting the translated data to the second device; and

billing the second device for the data according to the billing information.

17. The method of claim **16**, wherein the billing information corresponding to the request for the data from the second device comprises a billing amount based on the characteristics of the data requested.

18. The method of claim **16**, wherein the billing information corresponding to the request for the data from the second device comprises a billing amount based on a subscription associated with the second device.

19. The method of claim **16**, further comprising determining whether the second device is authorized to receive the requested data based on a subscriber account associated with the second device.

20. The method of claim **16**, further comprising storing information associated with the transmission of data between the first and second devices in a log.

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